

**WHITE PAPER ON LAND,
INFRASTRUCTURE, TRANSPORT
AND TOURISM IN JAPAN, 2015**



**Ministry of Land, Infrastructure,
Transport and Tourism**

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※ Maps used in this white paper may not necessarily indicate Japanese territory comprehensively.

Preface

Japan has become a society with a rapidly graying population, and the productive-age population to support industries continues to decline. Also, Japan faces increasingly severe fiscal restrictions and global competition.

On the other hand, it is possible to achieve sustainable economic growth if we increase productivity by reducing waste in society even with continued declines in the labor force that has supported the economy up until now.

Based on this perspective, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) will position 2016 as the “Starting Year of Productivity Revolution” and work on the revolution of productivity with all-out efforts in order to realize economic growth through improved productivity in every aspect of society in the face of a declining population [Note 1](#).

With the background and awareness of the issues mentioned above, Part I of the FY 2015 MLIT White Paper “Developments in Land, Infrastructure and Transport Administration that Underpin Japan’s Economic Growth—Strategic infrastructure management that brings about productivity revolution—” explains and discusses the MLIT policies that support Japan’s economic growth from infrastructure-related approaches [Note 3](#) by focusing on strategic infrastructure development with high stock effects [Note 2](#) to increase society’s base productivity and examine the future direction.

Specifically, Chapter 1: Relationships between Japanese Economy and Land, Infrastructure and Transport Administration looks at population declines, economic and fiscal conditions, and other challenges faced by Japan, and then examines the effects of infrastructure development on economic growth from historical viewpoints by reviewing the history of infrastructure development, the transition of infrastructure investment, and the effect from accumulated infrastructure stock in the early modern era, especially in the Edo period and the post-war economic growth period.

Chapter 2: Strategic Infrastructure Management That Brings About a Revolution in Productivity explains the efforts aimed at maximization of stock effects. Examples include the following: productivity improvement (e.g., maximizing the existing facilities with “smart investment, smart use” attempts, “visualizing” the stock effect) presupposing the securement of safety and reassurance, case examples of public-private partnership efforts to create new private sector demand and efficient development and operation of infrastructures, and clarification of the relationships between corporate activities and infrastructure and what is expected of both the infrastructure developer and the user sides to maximize stock effects, and finally, productivity improvement by conducting opinion surveys (questionnaires) on private business operators that are users of infrastructures.

Chapter 3: Cultivating and Expanding New Markets, Securing Leaders, and Adopting New Technologies explains, in light of tapping overseas growth fields, case examples of efforts for overseas expansion of infrastructure systems and attracting inbound foreign tourists by leveraging infrastructures, as well as forward-looking initiatives that contribute to securing bearers of the construction industry that support infrastructure development and productivity improvement in infrastructure development sites such as i-Construction.

Note 1 Specifically, the MLIT Productivity Revolution Headquarters was established within the MLIT, and the Headquarters will work on productivity improvement in three areas: (i) “Society’s Base”, (ii) “By industry”, and (iii) “Future oriented” investments and new technologies, and specific projects will be released in sequence as they mature.

Note 2 Stock effect: “Stock effect of infrastructure is the effect that can be gained as infrastructure developed functions right after construction and continuously for a medium-to-long term, and such effects include effect of improving safety in case of disasters and effect of life quality improvement, such as; improved living conditions; and production expansion effect, such as increased efficiency and productivity by reduction of travel time.” (Chapter I, Section 2.2 (1) (i) of Priority Plan for Infrastructure Development (decision by Cabinet Office in September 2015))

Note 3 Definition of infrastructures: In this White Paper, unless otherwise specifically noted, infrastructure means in a broad sense physical social capital under jurisdiction of the MLIT (e.g., roads, railway, ports and harbors, levees, dams, sewerage systems, parks) and public transportation services provided in association with transport related physical social capital. Generally, physical facilities of roads and sewerage systems are assumed as the infrastructure. For example, the Kojien dictionary (6th edition) explains infrastructure as “facilities that serve as foundation of industries and social life. This includes social capital that includes roads, railways, ports and harbors and dams, as well as life-related social capital such as schools, hospitals, parks and social welfare facilities.”

The series of earthquakes that hit mainly Kumamoto and Oita after the night of April 14, 2016, caused enormous damage. This White Paper reports on responses to the 2016 Kumamoto earthquake (as of mid-May 2016) as a supplemental section.

In Part II, the progress made in FY 2015 by sections of the MLIT administration will be reported for each policy issue.

Part I

Developments in Land, Infrastructure, Transport and Tourism Administration that Underpin Japan's Economic Growth

**~ Strategic infrastructure management
that brings about productivity revolution ~**

Chapter 1

Relationships between Japanese Economy and Land, Infrastructure, Transport and Tourism Administration

Chapter 1, Relationships between Japanese Economy and Land, Infrastructure, Transport and Tourism Administration, on the assumption of discussions described in chapter 2 and following sections, looks at the significance of the effects infrastructure development has on economic growth with awareness of severe circumstances surrounding the Japanese economy from the perspective of history and statistical data.

Section 1, Japanese Economy and Its Surrounding Conditions, provides an overview of an increasingly declining population, especially that of a productive-age population, to become a super aging society with an estimated aging rate of close to 40% in 2050, and a severe fiscal position due to rapidly growing, long-term outstanding debts and other circumstances.

Section 2, Economic Trends and Infrastructure Development, looks at how infrastructure has supported peoples' lives and the economy of the time by exploring economic growth and the history of infrastructure development (Edo period and post-war economic growth period). In international comparisons of the level of public investment, we describe the need to consider Japan's poor land and severe natural environment, provide an overview of the stock effect of the infrastructure, and examine its impact on the infrastructure, productivity, and economic growth.

Section 1

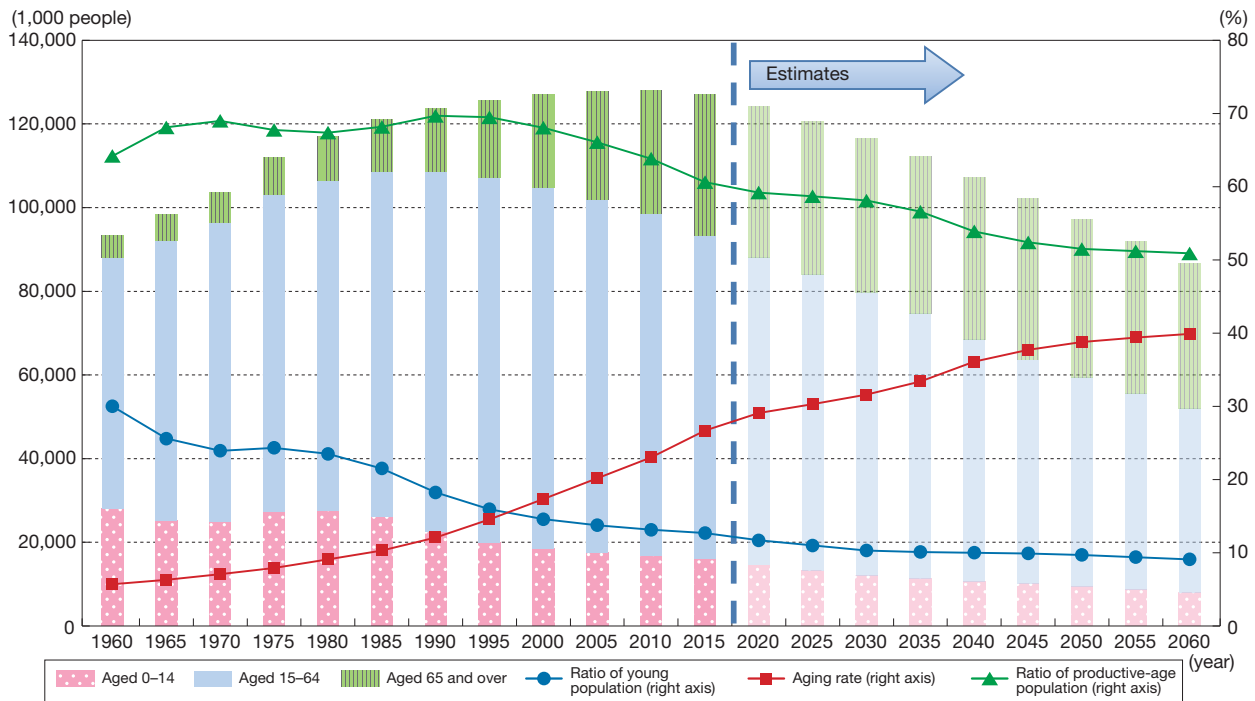
Japanese Economy and Its Surrounding Conditions

1 Japan's Population Conditions and Future Estimates

(1) Changes in population and productive-age population

Because of the progression of declining birthrate and aging population, the total population of Japan is falling after peaking in 2008, with the productive-age population also decreasing after the peak in 1995. The preliminary figure from the National Census in 2015 showed that the total population of Japan declined for the first time since the quinquennial Census, falling to 127,110,000. According to the projection of the National Institute of Population and Social Security Research (median projection for birth/death), the total population is projected to decline to 116,620,000 in 2030 and 86,740,000 in 2060 (down 32.3% when compared to 2010), with the productive-age population projected to decline to 67,730,000 in 2030 and 44,180,000 in 2060 (down 45.9% when compared to 2010) (Figure 1-1-1).

Figure 1-1-1 Changes in Population Structure in Japan

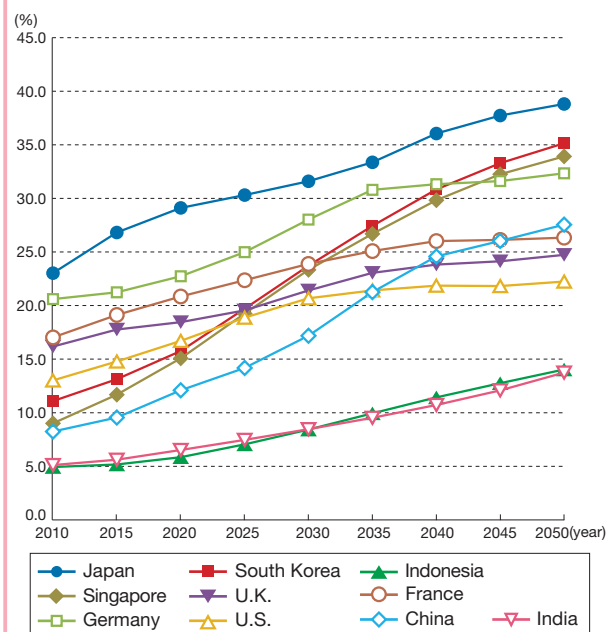


Source) "National Census" and "Population Estimates" by the Ministry of Internal Affairs and Communications for dates up to 2010, "Population Estimates" by the MIC for 2015 data (as of October 1, 2015); estimates are calculated by the MLIT from the median estimates of "Japan's future population estimates" (estimates from January 2012) by IPSS.

(2) Severely aging population

In addition, Japan's aging rate ^{Note 1}, which reached the record high of 26.7% in 2015 ^{Note 2}, is not only at the highest level but also exceptionally high when compared to that of other nations (Figure 1-1-2). Furthermore, Japan is projected to become a super aging society, with its aging rate topping 30% in 2025 and reaching close to 40% in 2050.

Figure 1-1-2 Changes in Population Aging Rate of Japan and Other Countries



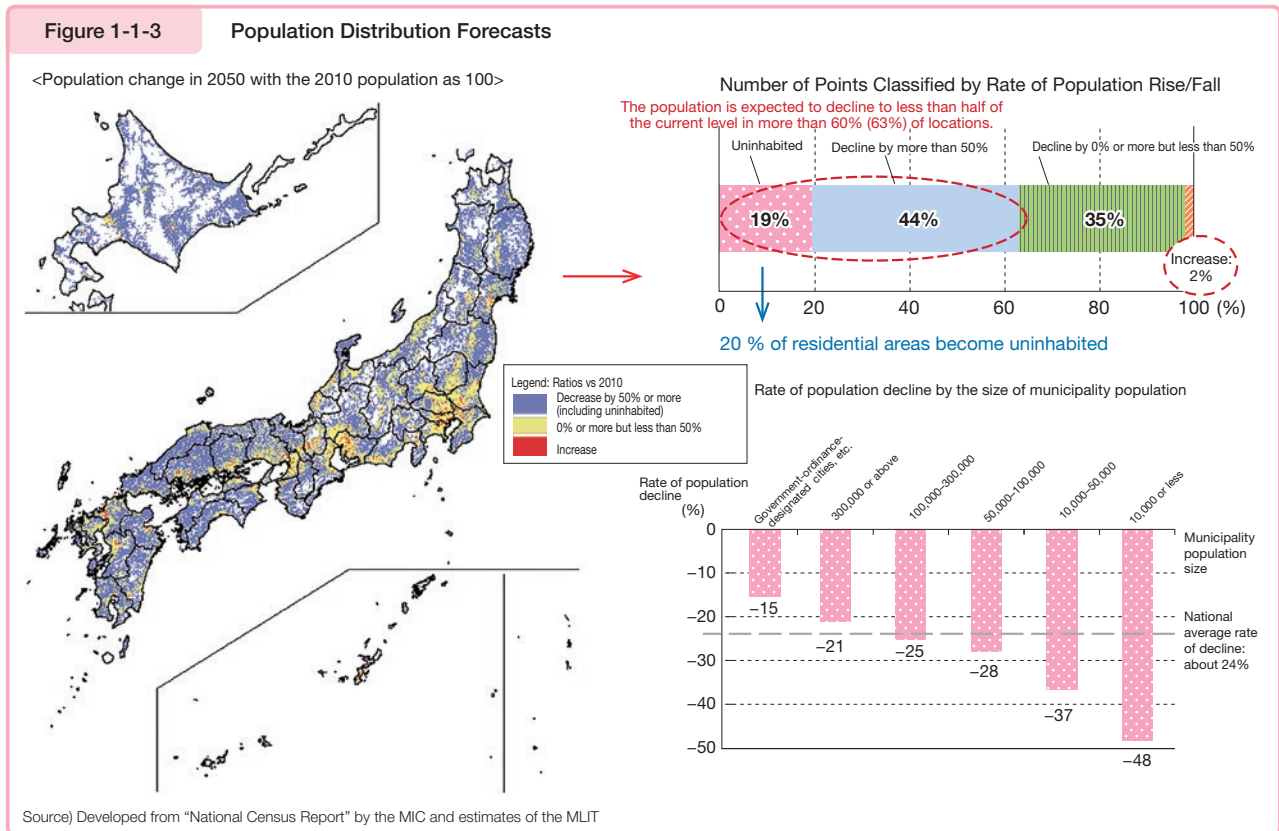
(Note) The populations of Japan and countries other than Japan in 2010 are actual figures and after 2010 figures are median estimates.
 Source) For Japan: "Population Projections for Japan" (Estimated in January 2012) by IPSS.
 For countries other than Japan: Developed by MLIT from United Nations' World Population Prospects: The 2015 Revision"

Note 1 The ratio of elderly (65 years old and over) population to total population.

Note 2 "Population Estimates" (as of October 1, 2015) by the MIC

(3) Difference in demographic shift by region

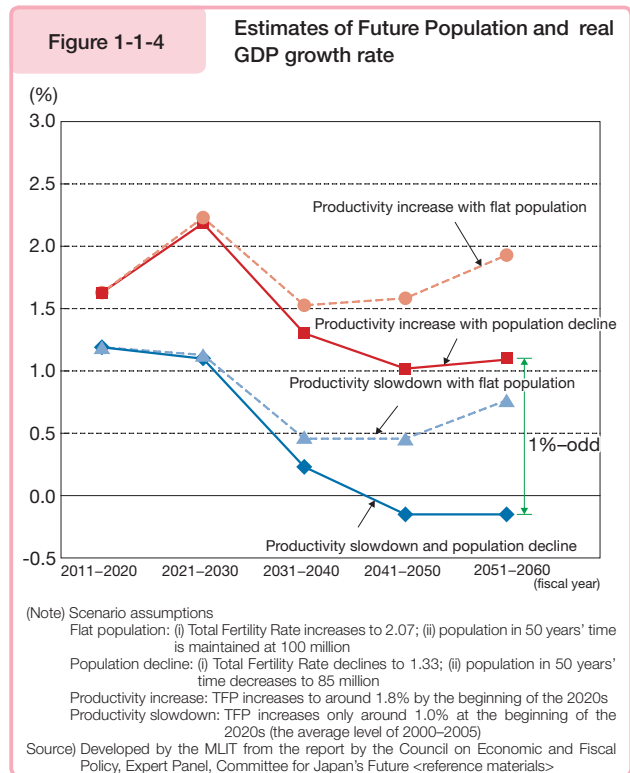
According to projections of population distribution by region, over 60% of residential areas are projected to see their population decline by half and about 20% will become nonresidential areas during the period from 2010 to 2050 (Figure 1-1-3). Also, projected changes in population by smaller municipality units show that the smaller the size of municipality is, the higher the rate of population decline will be; municipalities with populations less than 10,000 are projected to see their population decrease by about half during the period from 2010 to 2050. Population increases are projected only in limited regions including the Tokyo and Nagoya areas, and depopulation is expected to become more severe across Japan. In depopulated areas, not only the younger population but also the elderly population is about to start declining.



(4) Depopulating society and Japan's economic growth with higher productivity

While it was pointed out that population declines will lead to a smaller size in the overall economy of Japan, the report by the Council on Economic and Fiscal Policy, Expert Panel, Committee for Japan's Future expects that downward pressure is expected to be put on economy in the 2030s and 2040s, as population of working generations will start declining at a faster pace. A decreasing population, and consequent stagnation of the economy, would send it into negative growth in the 2040s, a situation we might find difficult to get out of once falling into it [Note 3](#).

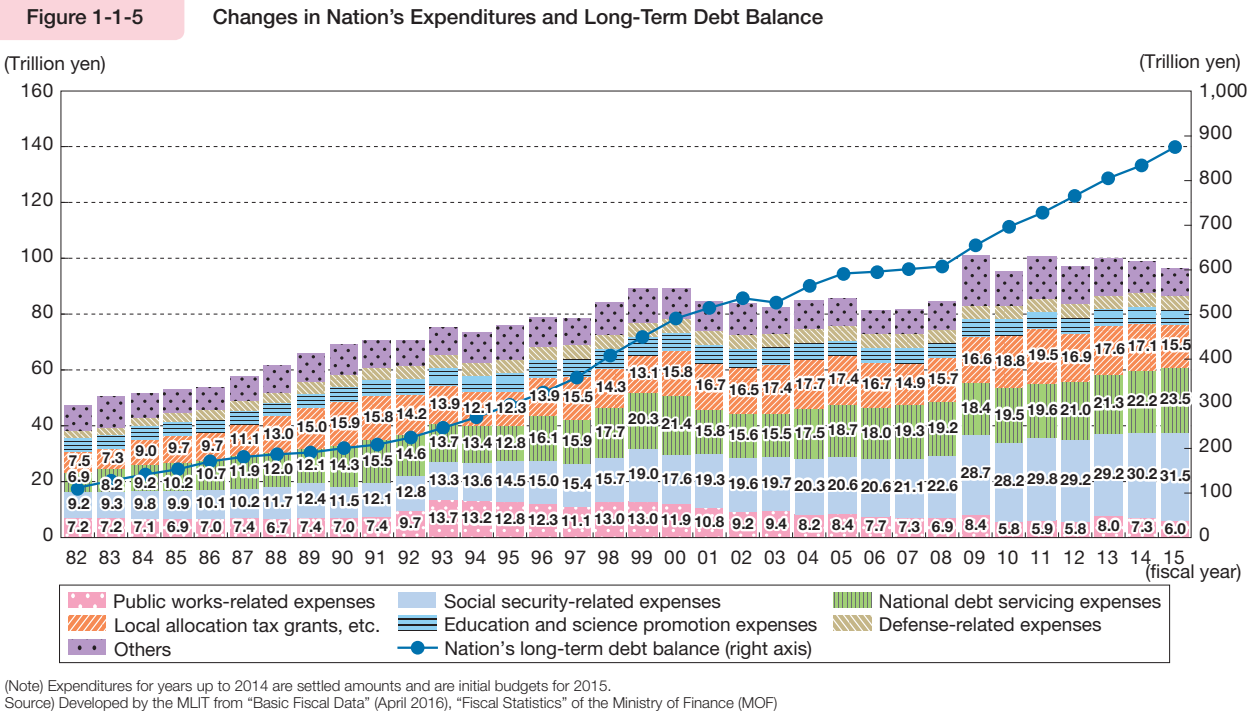
On the other hand, even with population declines, there will be a 1%-odd difference in real GDP growth rates between the production increase scenario and the flat productivity scenario (Figure 1-1-4). If increased productivity can compensate for the negative factor of a declining workforce, economic growth is considered achievable even with a declining population going forward.



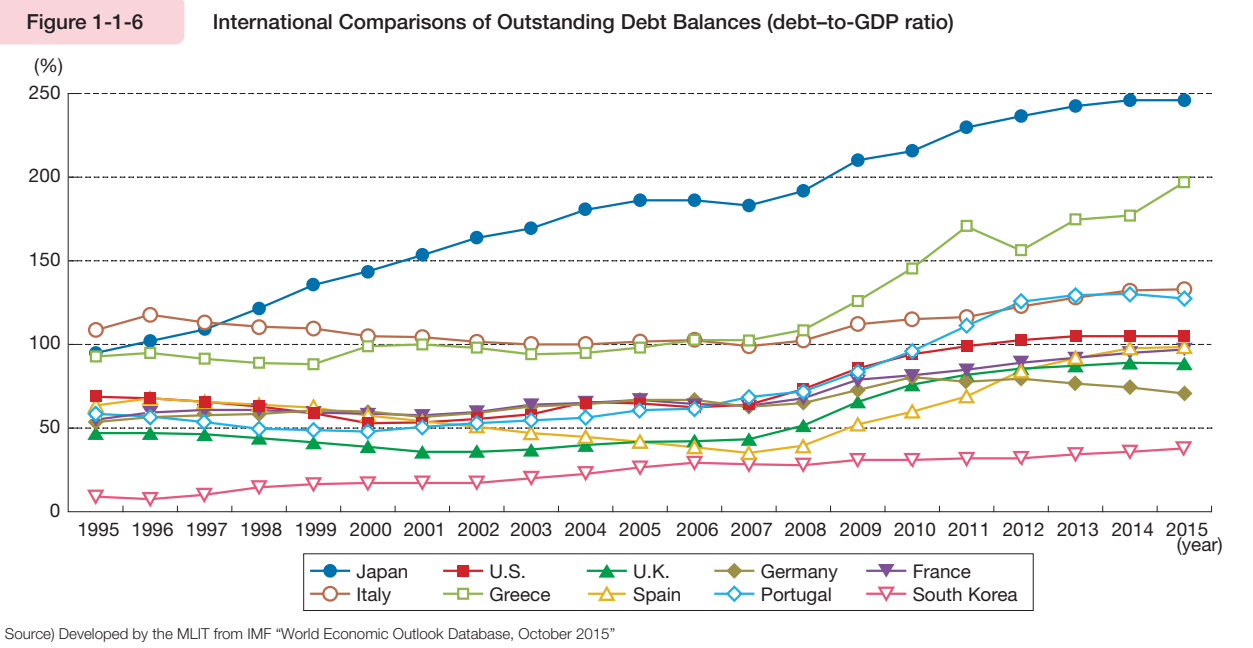
Note 3 According to the report by the Committee for Japan's Future, it supposed two population scenarios, the case of population becoming flat at around 100 million and the case of population continuing to decrease, as well as two scenarios for productivity, on in the case of increased productivity through improvements and one in the case of a slowdown in productivity.

2 Japan's Fiscal Situation

In terms of outstanding debt, Japan's fiscal position is deteriorating further due to increases in social security-related expenses, national debt servicing expenses, and local allocation tax grants. At the end of FY 2015, the nation's long-term debt balance reached 874 trillion yen (Figure 1-1-5).



The debt to GDP ratio provides a measure of debt against economic size, which is a key indicator of fiscal soundness. Japan faces the most severe situation in comparison with other nations (Figure 1-1-6).



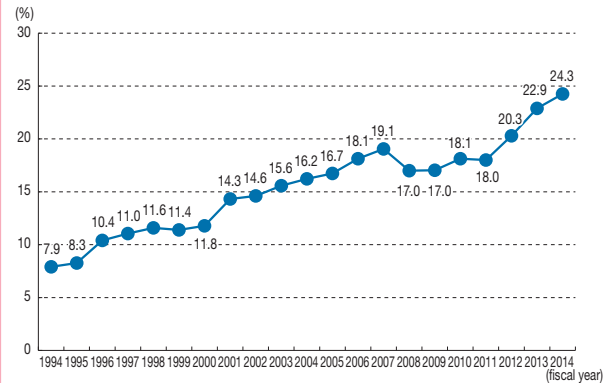
3 International Conditions

(1) Structuring international division of labor

Since the global economic downturn by the collapse of Lehman Brothers in 2008, the yen has been on a strengthening trend, prompting Japanese companies to build overseas production bases. This created flows of production and sale of products overseas, resulting in decreased exports from Japan [Note 4](#). The overseas production ratio of the manufacturing industry [Note 5](#) is on an increasing trend, exceeding 20% since FY 2012 (Figure 1-1-7).

Figure 1-1-7

Trend in Overseas Production Ratio (Manufacturing industry)



(Note) Overseas Production Ratio = overseas subsidiaries (manufacturing industry) net sales / (overseas subsidiary (manufacturing industry) net sales + domestic subsidiaries (manufacturing industry) net sales) × 100

Source) Developed by the MLIT from MOF's "Financial Statements Statistics of Corporations by Industry" and Ministry of Economy, Trade and Industry (METI)'s "Basic Survey of Overseas Business Activities"

(2) Rise of emerging countries

Emerging economies, especially in Asia, have been growing and China's GDP exceeded that of Japan in 2010 (Figure 1-1-8) [Note 6](#). By per-capita GDP, Singapore's GDP topped that of Japan, clearly indicating a growth of Asian nations (Figure 1-1-9).

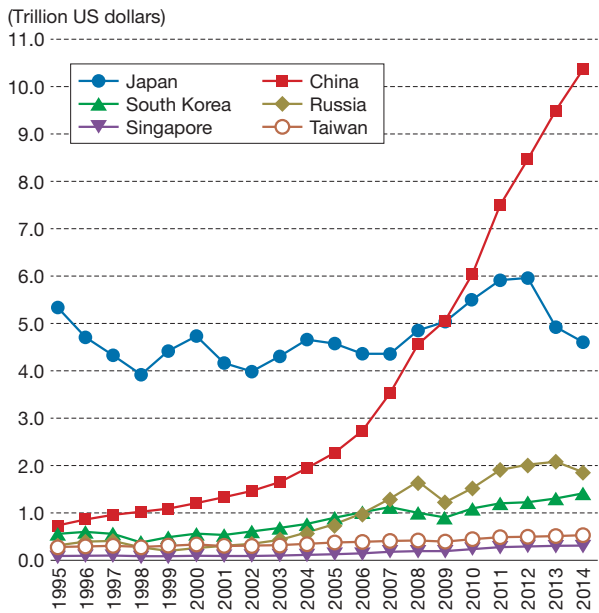
The Asian area where rapid economic growth is taking place is having a great effect on the development of Japan's industry base and overall economy, as well as being a great factor when we consider the future of regions in Japan.

Note 4 Although a move toward reshoring has been seen due to the yen's depreciation in recent years, Japan is in an environment to face fierce competitions with emerging countries mainly in Asia.

Note 5 Net sales of overseas entities divided by the sum of net sales of overseas and domestic entities.

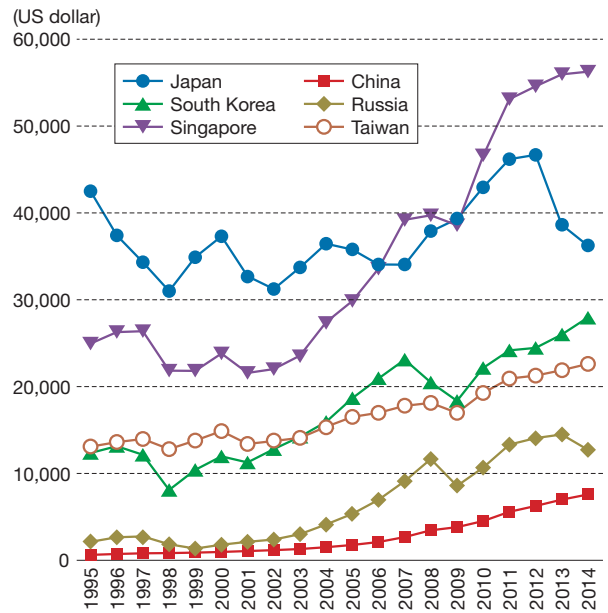
Note 6 Japan's GDP decreased in 2013 due largely to the impact of the yen's depreciation.

Figure 1-1-8 Changes in GDP (nominal) of Asian Nations and Russia



(Note) The decrease in Japan's GDP in 2013 is due mainly to the yen's depreciation (Japan's GDP (nominal) increased in 2013 and onwards on a yen basis).
Source) Developed by the MLIT from IMF "World Economic Outlook Database, October 2015"

Figure 1-1-9 Changes in per capita GDP (nominal) of Asian Nations and Russia



(Note) The decrease in Japan's per-capita GDP in 2013 is due mainly to the yen's depreciation (Japan's per-capita GDP (nominal) increased in 2013 and onwards on a yen basis).
Source) Developed by the MLIT from IMF "World Economic Outlook Database, October 2015"

(3) Infrastructures capable of supporting international competitiveness

In order to strengthen Japan's international competitiveness vis-à-vis intensifying international competition in the global economy, it is necessary to improve industrial locations and working/living environments with the arrangement of industrial/urban infrastructures, as well as to strengthen transportation/logistics services with well-established transport networks.

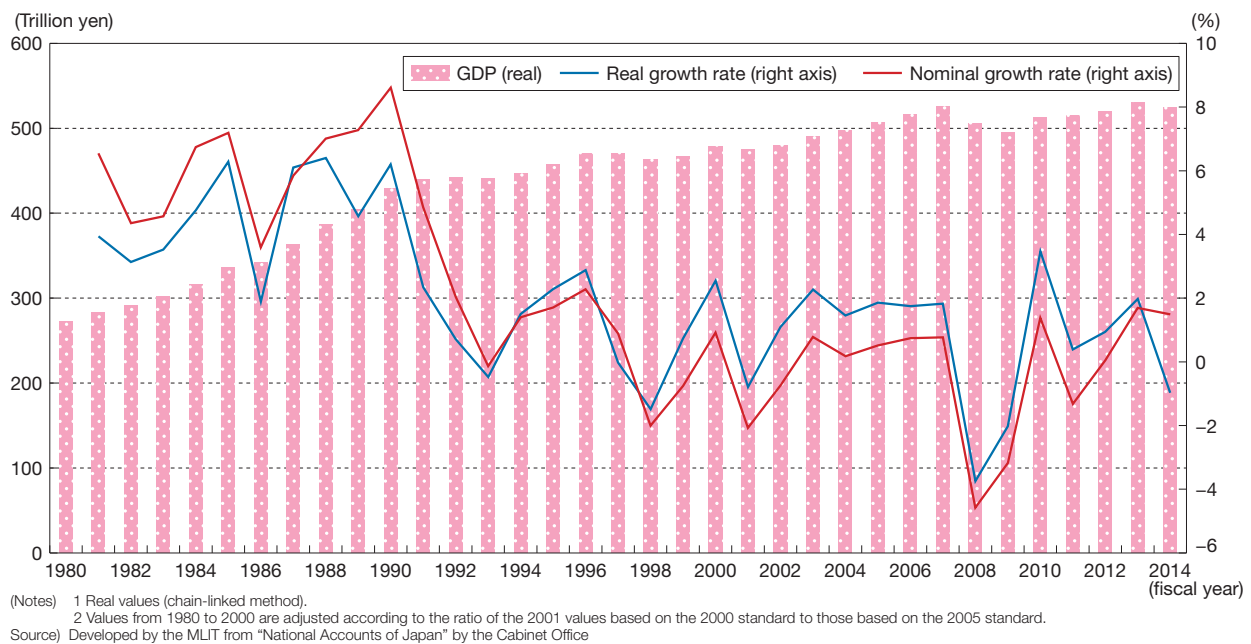
4 Japan's Economic Situation

(1) Current status and growth rate of Japan's economy

The Japanese economy overcame the slowdowns from the effects of the Lehman Shock in the fall of 2008 and the Great East Japan Earthquake in 2011, getting back on a growth track at the end of 2012, but the GDP growth rate has been at low levels in recent years compared to the 1980s' levels (Figure 1-1-10). Despite the impact of a bump in demand before the consumption tax increase in April 2014 and subsequent reaction to it, since late 2014, consumer confidence bottomed out and personal consumption, housing investment, and the like have been robust. Japan's real GDP grew in the January-March quarter of 2015, boosted by increases in private-sector demand like personal consumption, housing investment and capital investment ^{Note 7}.

Note 7 Source "Annual Report on the Japanese Economy and Public Finance 2015-Chapter 1, Section 1. 2 Recent Economic Conditions (August 14, 2015)" by the Cabinet Office

Figure 1-1-10 Changes in Japan's GDP



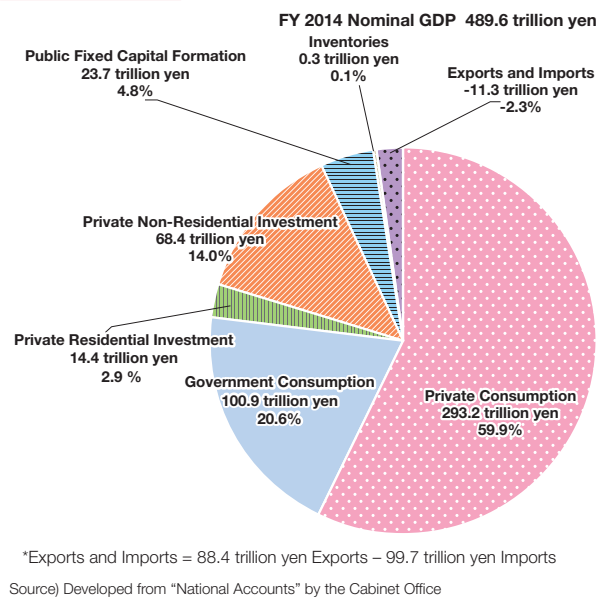
(2) GDP (Expenditure Approach) and Its Components

Gross domestic product (GDP) ^{Note 8} published by the Cabinet Office is the "total value added by goods and services produced during a given period of time in Japan" and quarterly estimates (QE) of GDP are released. QE calculates GDP by adding up estimates of GDP demand items, including Private Consumption ^{Note 9}, Gross Fixed Capital Formation ^{Note 10}, Change in inventories, Exports and Imports (Net Exports of Goods and Services ^{Note 11}), and Private Consumption which account for about 60% of GDP (Figure 1-1-11).

(Private Residential Investment ^{Note 12})

Private Residential Investment in FY 2014 decreased from the previous fiscal year partly due to reaction to a bump in demand in association with the consumption tax increase, although improvements in employment/income environment, reconstruction demand from the Great East Japan Earthquake, and the like were expected (Figure 1-1-12).

Figure 1-1-11 Composition of nominal GDP (expenditure approach)



Note 8 Since it is "domestic," added values of goods and services produced by Japanese companies at overseas branches and the like are not included.

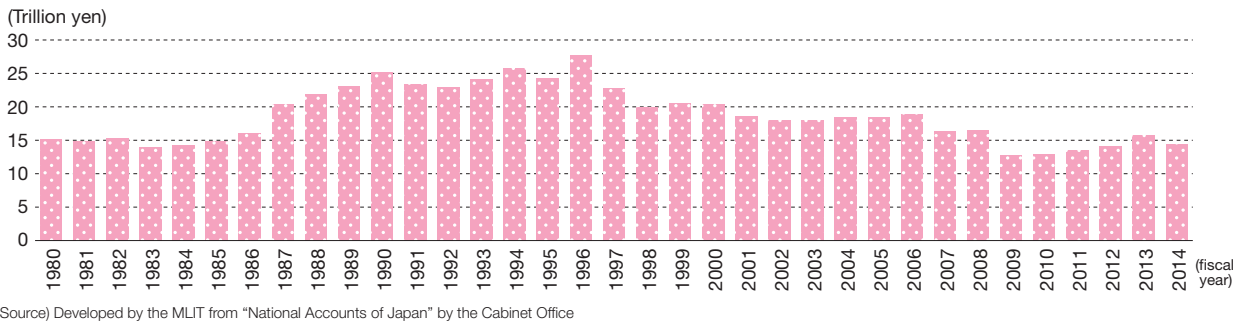
Note 9 Private Consumption is the sum of Consumption of Households and Final Consumption Expenditure of Private Non-Profit Institutions Serving Households.

Note 10 Gross Fixed Capital Formation consists of Private Residential Investment, Private Non-Residential Investment, and Public Investment.

Note 11 Net Exports of Goods and Services = Exports of Goods and Services - Imports of Goods and Services

Note 12 Private Residential Investment is estimated by the quarterly total of Residential Investment amount after subtracting separately estimated quarterly Public Residential Investment.

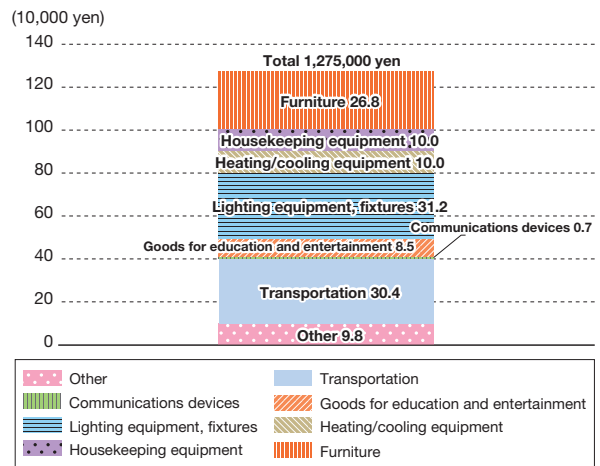
Figure 1-1-12 Changes in Nominal Private Residential Investment



Source) Developed by the MLIT from "National Accounts of Japan" by the Cabinet Office

Private Residential Investment accounts for about 3% of GDP, a ratio not necessarily large compared to other demand items (preceding Figure 1-1-11). However, the production-inducing effect of Residential Investment, which has secondary effects on the overall economy, is big because housing construction related industries are wide-ranging and broad, including construction, real estate, steel, and non-ferrous metal industries. Furthermore, when moving to a new house, demand for home appliances, furniture, and other durable goods are boosted; the purchase amount per household totals to about 1.275 million yen (Figure 1-1-13). Therefore, private residential investment is equally as important as public investment among MLIT related GDP items.

Figure 1-1-13 Breakdown of Durable Goods Purchased upon Home Purchase



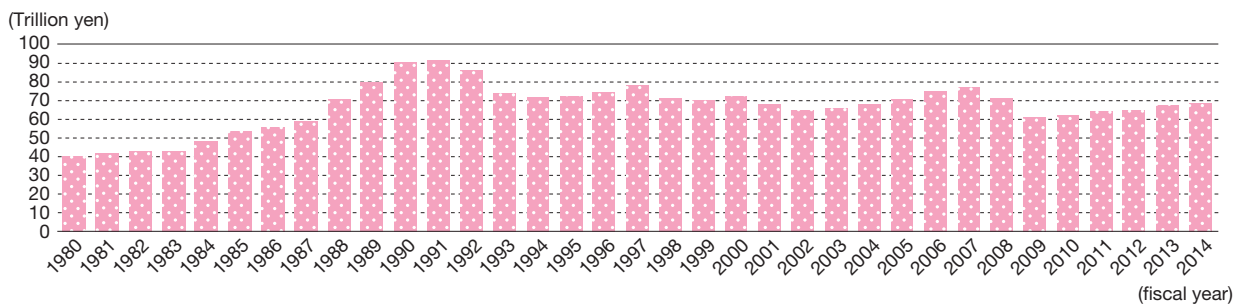
Source) Developed by the MLIT from "Survey on Consumption Relating to Home Purchases (FY 2014)" of Japan Housing Finance Agency

(Private Non-Residential Investment)

Nominal GDP for FY 2014 was 489.6 trillion yen, and Private Non-Residential Investment, which stood at 68.4 trillion yen, accounted for about 14% of the GDP figure. The ratio is not necessarily high compared to that of personal consumption or other items, but the condition of Private Non-Residential investment is closely watched because it is likely to fluctuate and has big impact on overall economic fluctuations.

Capital Investment increased for six consecutive years until FY 2014 on the back of improvements in corporate earnings (Figure 1-1-14). As labor force is expected to decline, the roles played by Capital Investment in improving productivity are increasingly important, in order to prop up Japan's growth potential from the supply side.

Figure 1-1-14 Changes in Nominal Capital Investment

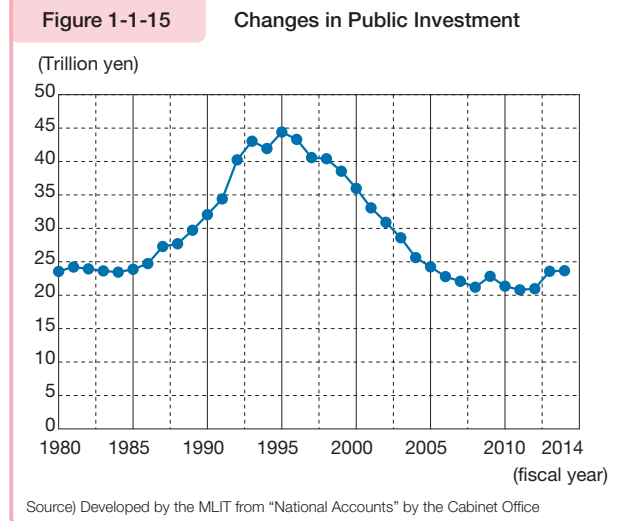


Source) Developed by the MLIT from "National Accounts" by the Cabinet Office

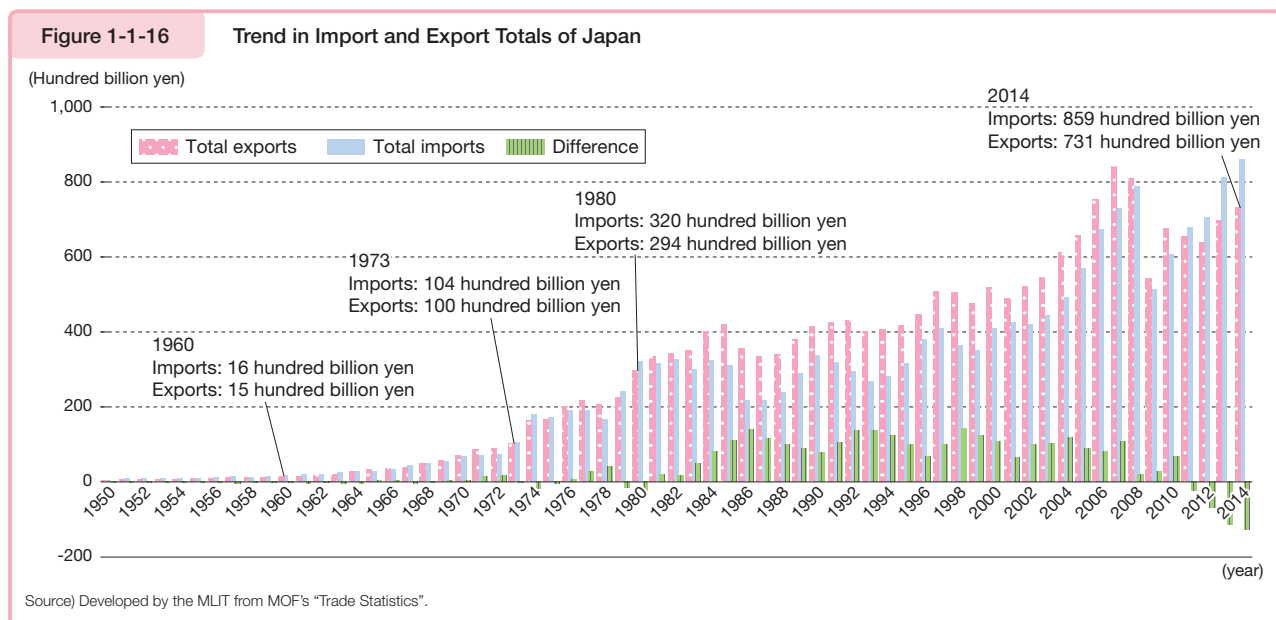
(Public Investment)

Public Investment published in QE is generally used to capture public investment trends. Public Investment indicates investment by the government and public corporations in increases in fixed capital stock and consists of the following three: (i) investment in public housing, (ii) investment in mechanical equipment and buildings used for operation of public corporations, and (iii) investment in public works and construction of facilities conducted by general government (national and local governments) ^{Note 13}.

Public Investment, which was on a declining trend after the peak of 44.4 trillion yen in 1995, is increasing after mid-2013, partly due to expenditures relating to the Great East Japan Earthquake (Figure 1-1-15).

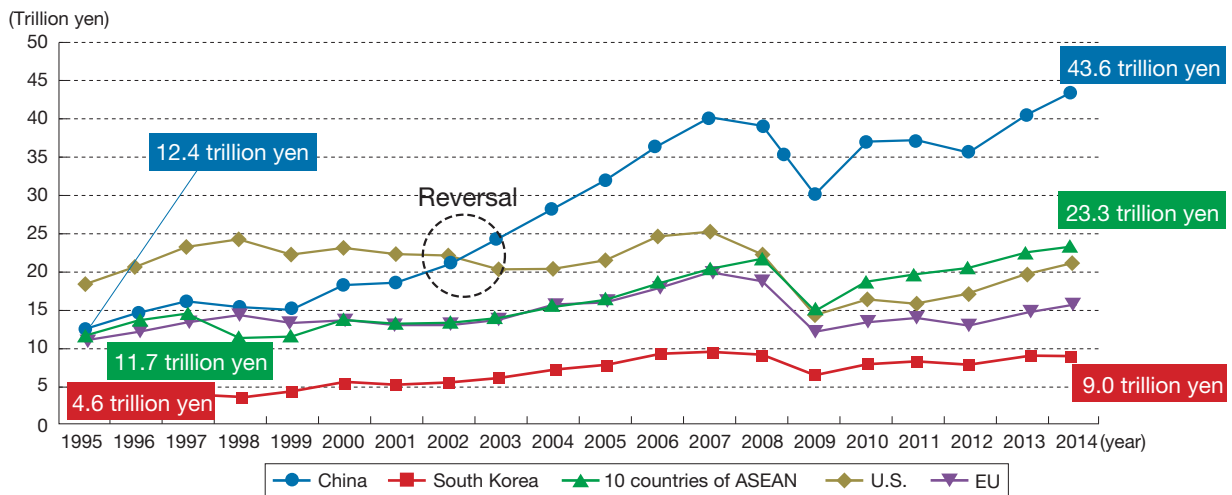
**(Total exports and imports)**

For trade with foreign countries, Japan's exports in 1960 were approximately 1.5 trillion yen, and imports were around 1.6 trillion yen. However, from 1973, both imports and exports climbed to the 10 trillion level, and by 1980 both had expanded into the 30 trillion yen range. Japan's trade balance was in surplus from 1981 to 2010 but has fallen into deficit since 2011, posting exports of about 73 trillion yen and imports of about 86 trillion yen in 2014 (Figure 1-1-16). In terms of trade partners, the U.S. had been the biggest trade partner for a long time, but China surpassed the U.S. in 2003 and since then has been Japan's number one trade partner (Figure 1-1-17).



Note 13 Public Investment is recorded in QE according to the progress of construction projects similar to the "Estimate of Construction Investment". On the other hand, finalized Public Investment is estimated based on the government's financial statements and expenditures paid for public works at the financial closing of local governments.

Figure 1-1-17 Changes in Trade Amounts by Trade Partner Countries for 1995–2014



Source) Developed by the MLIT from MOF's "Trade Statistics"

According to the national accounts of Japan, exports of goods and services accounted for about 18% of GDP in FY 2014, indicating that the significance of external demand's contribution to economic growth is relatively important as the pace of increase in domestic demand is on a declining trend.

For example, overseas development of infrastructure systems is expected to boost Japan's economic growth by tapping huge infrastructure demand in emerging countries and other nations [Note 14](#). A report by the Organization for Economic Co-operation and Development (OECD) [Note 15](#) estimates annual global infrastructure demand in 2030 at 2.326 trillion dollars, which is huge. If Japanese companies win such overseas infrastructure markets in addition to the domestic one, it would not only contribute to increased earnings of Japanese companies, but also lead to enhanced cost competitiveness and productivity by leveraging scale advantage, return to domestic businesses by acquiring global standards, and economic revitalization of the Japanese economy.

(The Growing number of inbound foreign tourists)

On the back of affordability created by the yen's depreciation and eased visa requirements for travels to Japan, the number of foreign visitors to Japan is rapidly increasing. According to the Tourism Agency, the number of foreign tourists visiting Japan was the largest ever at about 19.74 million in 2015 (Figure 1-1-18). Also, the consumption amount of foreign visitors to Japan in the same year increased 71% from the previous year, to the record high of 3,477.1 billion yen (Figure 1-1-19).

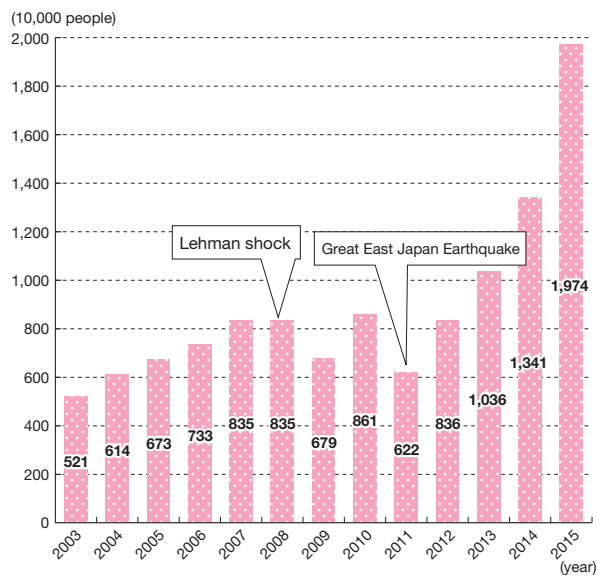
The consumption amount of foreign visitors in Japan is counted toward exports, not personal consumptions, for GDP statistics purposes [Note 16](#).

Note 14 Overseas development of infrastructure systems also has the aspect of pushing up GDP and GNI. In the case of selling out railway vehicles produced in Japan, the value is recorded in "exports" of GDP components. On the other hand, stock dividends, in the case of establishing a local SPC and being involved in operation, are not included in GDP but included in GNI, which is the gross income the public receives and includes wealth gained from overseas.

Note 15 Computed by the MLIT from OECD (2006/2007) "Infrastructure to 2030" and OECD (2012) "Strategic Transport Infrastructure Needs to 2030"

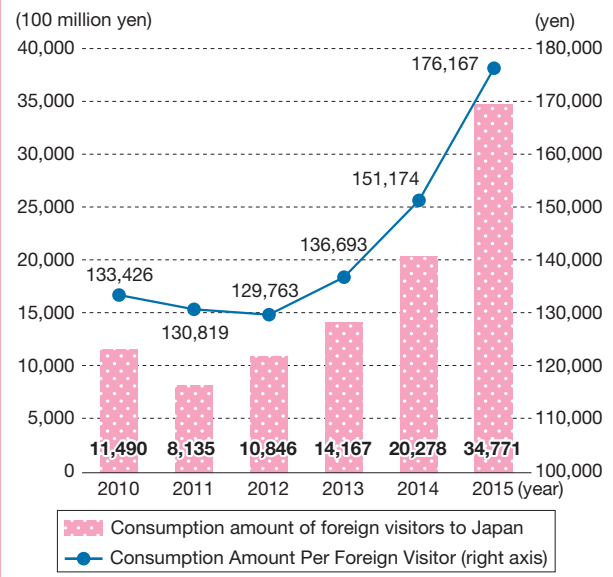
Note 16 Personal consumption conceptually covers consumption by citizens in Japan. On the other hand, consumption by inbound foreign visitors in Japan (easy-to-understand example is the purchase of souvenirs) is positioned as exports in a broad sense even if they are consumed in Japan.

Figure 1-1-18 Changes in the Number of Inbound Foreign Tourists



(Note) Provisional figures for 2015
 Source) Developed by the MLIT from materials of the Japan National Tourist Organization (JNTO)

Figure 1-1-19 Changes in Annual Travel Consumption and Per Capita Travel Expenditures



Source) "Consumption Trend Survey for Foreigners Visiting Japan" by Japan Tourism Agency

(3) Changes in industrial structure

Amid changing population structure due to a declining and aging population, improvements to productivity, including technological innovations [Note 17](#) play important roles in order for the Japanese economy to grow.

Chapter 3, Section 1 of the Annual Report on the Japanese Economy and Public Finance 2015 of the Cabinet Office describes that the prolonged economic downturn is on the back of slow productivity increases, pointing to Japan's service industry [Note 18](#) where productivity gain is slow compared to other developed countries.

The ratio of the labor-intensive service industry to economic activity is increasing as the economy becomes service-based and society ages.

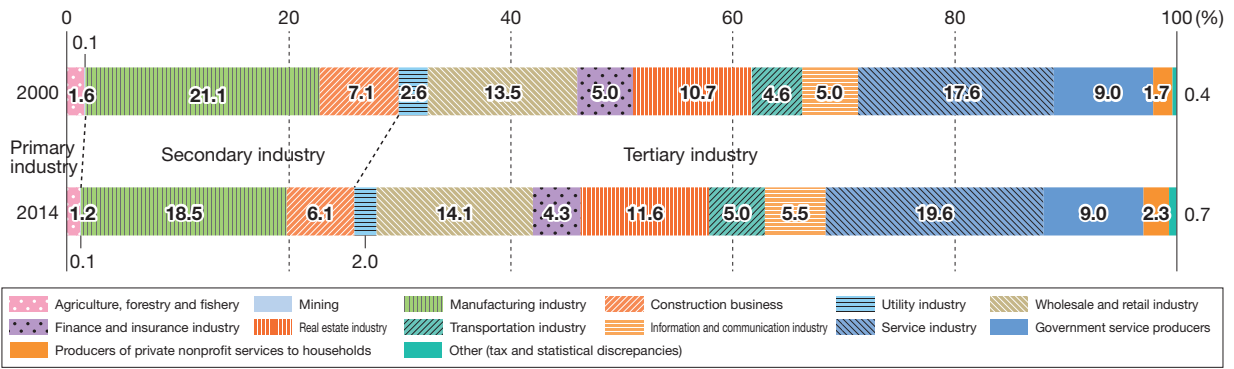
Advanced countries, including Japan, have shifted to service-based economies on the back of raises in demand for services in accordance with changes in social structure, such as higher income levels and a declining and an aging population. This has led to an expansion of demand for labor in non-manufacturing industries. In terms of the shares of GDP contribution and the number of employees to the overall economy, shift from the manufacturing industry to the service industry is happening.

The shift of economic structure from the manufacturing industry to the service industry is common across advanced economies. For Japan, the ratio of nominal value added by the service industry to the overall economy, which was 70% in 2000, rose to 74% in 2014 (Figure 1-1-20). Similarly, the ratio of workers engaged in the service industry increased from 65% in 2000 to 72% in 2013.

Note 17 Productivity is defined as "the ratio of output produced through production activities to inputs used in the production process" and the higher the ratio of output to input is, the higher the efficiency of production is.

Note 18 The service industry means the tertiary industry excluding the agriculture, forestry and fishery, mining, manufacturing industry, and construction business industries, and indicates utilities, wholesale and retail, finance and insurance, real estate, transportation, information and communication industry and other broad services in addition to services in the narrow sense, including services provided to individuals and business offices.

Figure 1-1-20 GDP (nominal) Ratio by Economic Activity

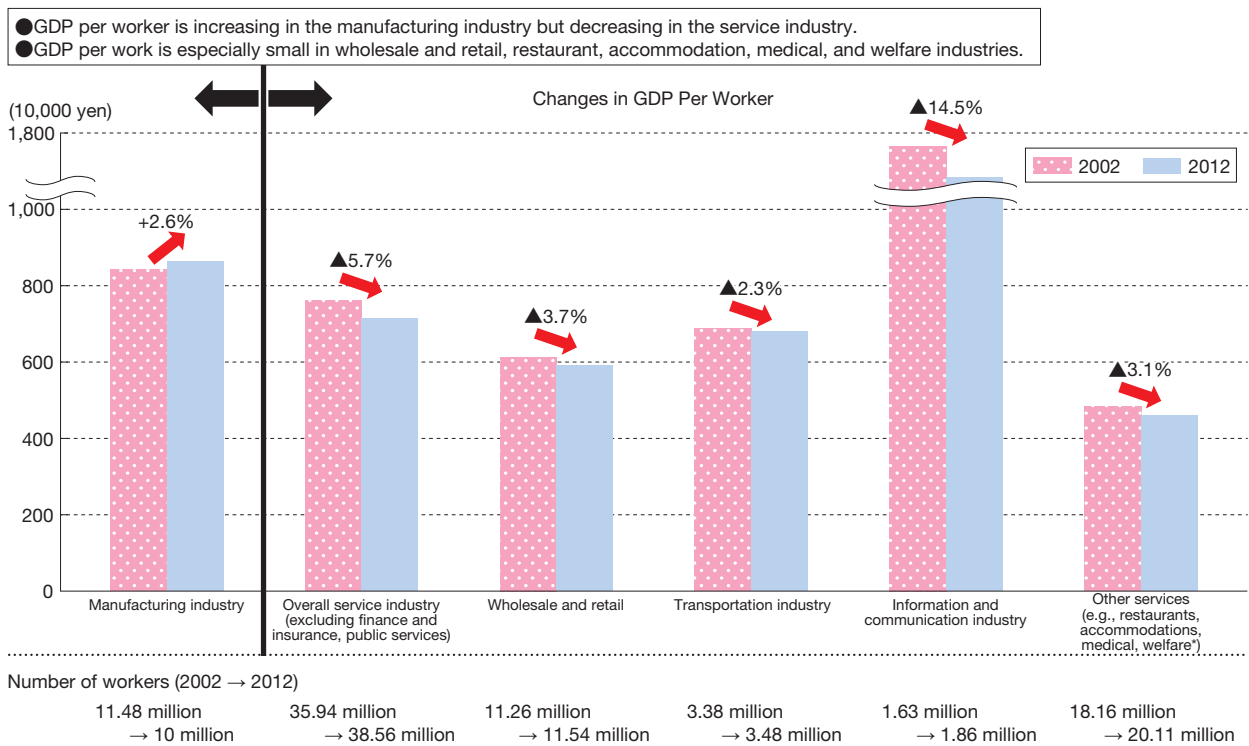


(Note) Government service producers: central and local governments
 Producers of private nonprofit services to households: private schools, NGOs, labor unions, political parties, religious organizations, etc.
 Source) Developed by the MLIT from "National Accounts" by the Cabinet Office

The productivity per worker in the service industry that accounts for about 70% of GDP and working-age population, however, is declining while that of the manufacturing industry is increasing. The GDP per worker is especially low in such services as wholesale and retail, restaurant, accommodation, medical, and welfare industries (Figure 1-1-21).

Amid these circumstances, it is especially important in the service industry to increase labor productivity by improving production efficiency, technological innovation, and the like.

Figure 1-1-21 GDP Per Worker



Source) "About Higher Added Values and Increased Productivity of the Service Industry" by METI

Section 2 Economic Trend and Infrastructure Development

1 History of economic growth and infrastructure development

This Section looks at the history of how infrastructure development supported economic activity and peoples' lives since the early modern period, focusing on infrastructure development in the Edo period and after World War II.

In an international comparison of the level of public investment, we explain the need to take into account Japan's poor land and the severe natural environment, provide overview of the infrastructure stock, and examine its impact on infrastructure productivity and economic growth.

(1) Infrastructure development that supported the life and economy in the Edo period

In the Edo period, large-scale town and social infrastructure development centered around Edo Castle were carried out which dramatically changed the towns of Edo.

The coastline that extended near the current Imperial Palace was reclaimed, moats were formed, Nihonbashi Bridge was built, and Gokaido Roads, or the five key roads, and other major transportation networks starting from Nihonbashi, were developed in the Edo period. These infrastructures were handed down to the current Heisei period.

Thus, we focus on Edo, the origin of Tokyo, and explore the infrastructure development and economic activity, peoples' lives, maintenance awareness, disaster prevention awareness, and the like in the period.

(Public works in the Edo period)

Who did public works and how?

In the Edo period, master-servant relationships between the Edo Shogunate and each domain were established and civil engineering projects, such as construction of Edo Castle, creation of ports, river improvement, and road development, were assigned to domain daimyo (feudal lords) as "tenka bushin" (a type of public works projects which the Edo Shogunate ordered), forcing each daimyo to bear economic burden. Also, partly due to large-scale infrastructure development centered around Edo Castle which required labor, Edo's towns became a major metropolitan area with a highly concentrated population.

(Reclamation of Hibiya inlet and Development of Edo- Port)

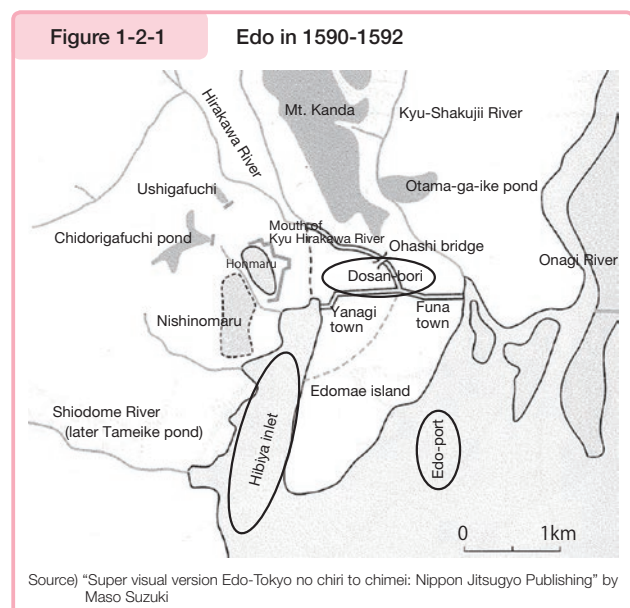
While the Edo Shogunate was founded in 1603 by Ieyasu Tokugawa, who had become shogun, Ieyasu also implemented various infrastructure developments before that.

Edo Castle was originally built by Dokan Ota in 1457 (Muromachi period). When Ieyasu entered Edo Castle in 1590, the castle, which was then over 130 years old, was dilapidated and surrounded by rundown castle towns. Therefore, Ieyasu planned infrastructure development around Edo Castle from an early stage after moving to the castle.

First, Ieyasu focused on the development of water transport networks centered around Edo Castle in order to transport goods in large volume to Edo by ship, and pushed forward the construction of Edo- Port (Figure 1-2-1).

In 1592, Dosan-bori that stretches from current Gofukubashi Bridge to Ote-mon Gate was constructed, which established a system of ship transportation to just below Edo Castle, thereby enabling transportation of goods, such as stone materials to build the castle.

Also, the coastline at that time extended to the area where the current Imperial Palace is located and Hibiya area was shallow water named Hibiya Inlet. In order to prevent enemy ships from entering the inlet from a military consideration,



a hill named Mt. Kanda (Surugadai) was leveled to reclaim Hibiya Inlet in 1596, and the reclaimed land was utilized for building urban areas and samurai residences.

(Eastward Move of Tone River and westward move of Arakawa River)

Tone River, which currently flows into the Pacific Ocean (Choshi-city, Chiba prefecture), flew into Edo Bay (current Tokyo Bay) in the Edo period (Figure 1-2-2).

Towns of Edo suffered frequent water damage due to floods and other disasters. The eastward move of Tone River started in 1594 in order to avoid water damage, develop farmland, and activate logistics by ship transportation.

In the eastward move of Tone River, construction projects for not only changing the flow of the river, but also for building levees and irrigation channels were conducted. These projects took 60 years and were completed in 1654. Also, a construction project to separate the Arakawa River, which joined the Tone River near Koshigaya, from the Tone River was conducted in 1629, resulting in the current path, flowing via the Sumida River into Tokyo Bay.

These projects contributed to flood prevention, development of new fields and water transportation, and supported the development of Edo.

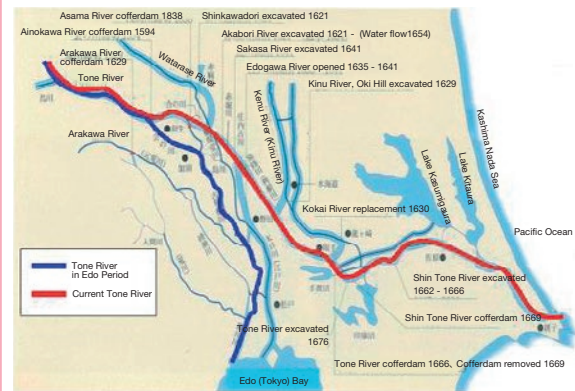
(Formation of traffic networks centered around Edo by building Gokaido Roads)

Ieyasu planned development of Gokaido Roads (or five key roads, i.e., Tokai-do Road, Nakasen-do Road, Nikko-kaido Road, Koshu-kaido Road and Oshu-kaido Road) based on the radial urban structure starting from Nihonbashi and, as a starter, built Tokai-do Road between Edo and Kyoto in 1601. The width of the Gokaido Roads including the Tokai-do Road was made wide, and they were used for Sankin-kotai (a system that obligated daimyo to reside in Edo periodically, taking turns) and other purposes. Also, roads called *wakikaido* (subsidiary roads) played the roles of supplementing transportation using the Gokaido Roads and serving as main roads that branch off from the Gokaido Roads to local regions, and many such *wakikaido* were built as roads for commoners (Figure 1-2-3).

Thus, the Gokaido Roads and other roads built across Japan by the Edo Shogunate supported the Sankin-kotai system and economies in the areas along the roads used for the system (e.g., prosperity of post towns along the roads). They are still serving as the delicate framework for the traffic networks of Japan, including railways and highways.

Figure 1-2-2

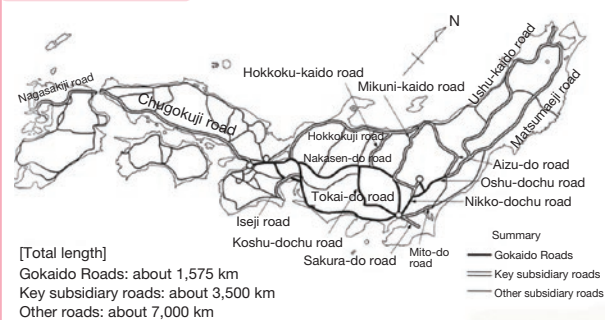
Tone River in Edo Period (Blue Line) and Current Tone River (Red Line)



Source) MLIT

Figure 1-2-3

Map of Gokaido Roads and Key Roads



Source) MLIT

■ Economic effect of Sankin-kotai

Sankin-kotai is a system in which daimyo traveling to and from Edo to fulfill their duty for alternate year-attendance at the Tokugawa shogunate government.

Although the size of the daimyo's procession varied depending on their stipend and class, many processions were conducted with 150 to 300 persons, and large domains carried out the procession in the size of a few thousand persons, moving in flocks and taking an even longer period (Figure 1-2-4).

The Sankin-kotai system had a significant effect on the economy through, for example, large-scale consumer activity that took place in towns across Japan and Edo (Figure 1-2-5).

In addition to the economic effect, various traditions and food cultures were developed and exchanged mainly in Edo, which served as the foundation for creating the flow of transportation to local regions across Japan.

Figure 1-2-4

Folding Screen of Kaga Domain Daimyo Procession



Source) Ishikawa Prefectural Museum Of History

Figure 1-2-5

Post Towns of Gokaido Roads (accommodations)

Name of Roads	Number of staging posts	Number of accommodation facilities		
		Honjin	Sub-Honjin	Hatagoya
Tokai-do road	57	116	70	3,103
Koshu-kaido road	45	41	44	525
Nakasen-do road	67	72	99	1,812
Nikko-kaido road	23	25	27	820
Oshu-kaido road	10	11	11	267

Source) Developed by the MLIT from the "Kinsei kotsu shiryoshu" (collection of historical early modern transportation)

In his diary of accompanying a visit to Edo "Edo Sanpu Zuiko Ki", Carl Peter Thunberg, a doctor and botanist at the Dutch trading house (who visited Edo in 1775), praised Japan's roads: "Roads of this country are kept in good conditions throughout the year, wide and have trenches for drainage." In the Edo period, commoners cleaned and maintained roads, and the description indicates that the maintenance conditions were at high levels compared to those of Western nations.

Among ukiyo-e paintings that are emblematic of the Edo period, *Fifty-three Stations on the Tokaido: Morning Scene at Nihonbashi Bridge* by Hiroshige Utagawa, which depicts artisans and merchants of bustling Nihonbashi, is especially famous. Also, Hokusai Katsushika painted energetic people on a bridge, having Mr. Fuji and Edo Castle in the background, in *36 views of Mount Fuji: Edo Nihonbashi* (Figure 1-2-6).

Nihonbashi, the starting point of roads in the Edo period, still serves this role because distances to Tokyo indicated in current road signs show those to Nihonbashi.

Figure 1-2-6

Nihonbashi in the Edo Period Painted in Ukiyo-E

Fifty-three Stations on the Tokaido: Morning Scene at Nihonbashi Bridge by Hiroshige Utagawa



36 views of Mount Fuji: Edo Nihonbashi by Hokusai Katsushika



Source) National Diet Library

Column Daily life and infrastructure in the Edo period as portrayed by Hiroshige Utagawa

Because cameras were not commonly used in the Edo period, we cannot actually see the pictures to suppose the daily life at the time. However, everybody would know the landscapes of areas in Japan as portrayed in ukiyo-e prints (woodblock prints depicting the ways of the world) by Hiroshige Utagawa (1797–1858), who passed on the scenery of Japan in the latter part of the Edo period to us (Figure 1-2-7).

Around the late Edo period, ordinary people in the Edo area preferred to travel the nation, and ukiyo-e prints, such as the *Fifty-Three Stations on the Tokai-do Road*, depicting noted places of post towns and sightseeing spots, were widely popular as souvenirs. Hiroshige mainly portrayed the lives of Edo citizens as the background for the seas, mountains, rivers, and ponds. These ukiyo-e prints depict the beautiful scenery using indigo blue as the keynote color and had a great influence on the French Impressionists such as van Gogh, creating the term “Hiroshige Blue” outside Japan.

He painted the infrastructures of the time—roads, bridges, rivers, and ports—everywhere in his paintings, along with a variety of nature landscapes, so we can suppose that the infrastructure had been developed in ancient times and were closely related to everyday life and the economic activities of Edo citizens (Figure 1-2-8).

Figure 1-2-7 Hiroshige Utagawa



Source) National Diet Library

Figure 1-2-8 Various Infrastructures Painted by Hiroshige Utagawa in *Fifty-three Stations on the Tokaido*

A mountain road was developed by cutting through a mountain
Nissaka-shuku (Kakegawa-city, Shizuoka prefecture)



Source) National Diet Library

Okazaki-shuku with a large-scale bridge
(Okazaki-city, Aichi prefecture)



(Agricultural production increased by development of farming water)

In the Edo period, about 80% of population lived in rural areas ^{Note 19}, thus increases in agricultural production directly led to economic growth. In association with progress in the development of new fields and irrigation since 17th century, production volume (in koku unit) increased by about 30% (Figure 1-2-9, Figure 1-2-10).

Note 19 See “History of Japan read from its population” by Hiroshi Kito (2007).

Yotsuya Okido about seven months later in November of the same year, and from Yotsuya Okido to Toranomom in November 1654, completing the whole Tamagawa Water Supply System in the short period of about one and half years.

Because of the success of the Tamagawa brothers, water from the Tamagawa Water Supply System was used for irrigation and drinking water by Edo citizens and it is still used as current Tokyo people's drinking water more than 360 years later.

(Sewerage systems in Edo)

In the Edo period, oil, chemical detergents, and the like were not used in large volumes as we do now, and human excrement was traded as a valuable resources to be used as fertilizer. Therefore, sewerage in the Edo period was mainly for rain and spring water, and its contamination level was said to be relatively low compared to current levels.

In the case of the Taiko Gesui (Sewerage System) (Osaka-city), built in the Azuchi-Momoyama period before the Edo period, town people jointly conducted water cleaning activity in accordance with the official notice of Machi-bugyo (town magistrate), and they are also said to have borne maintenance, repair and other expenses (Figure 1-2-12).

The Taiko Sewerage System has been used up until now after an elapse of 400 years since its construction, which indicates that appropriate maintenance enables such a system to serve as infrastructure that supports people's lives for a long time.

(808 Bridges of Naniwa)

Many towns were packed in Edo to the extent it was called "Edo 808 Towns of Edo." On the other hand, towns of Osaka with numerous bridges were referred to as the "808 Bridges of Naniwa" (Figure 1-2-13).

About half of the 350 bridges in Edo were public works bridges built by Shogunate.

Of Osaka's remaining bridges, only 12 were built through public works projects, such as Tenjin-bashi Bridge and Korai-bashi Bridge, and the rest of about 190 bridges were built by town people at their own expense for their living and business (Figure 1-2-14). Noninbashi Bridge (Osaka-shi) was one of the public works bridges, but duties of daily maintenance were imposed on town people around the bridge, including cleaning of the bridge, reporting of any crashing of a ship into the bridge and detention of the boatman, and reporting of any damage to the bridge.

Figure1-2-12

Taiko Gesui (Sewerage System) still being used (Osaka-shi)



Source) Construction Bureau, Osaka City

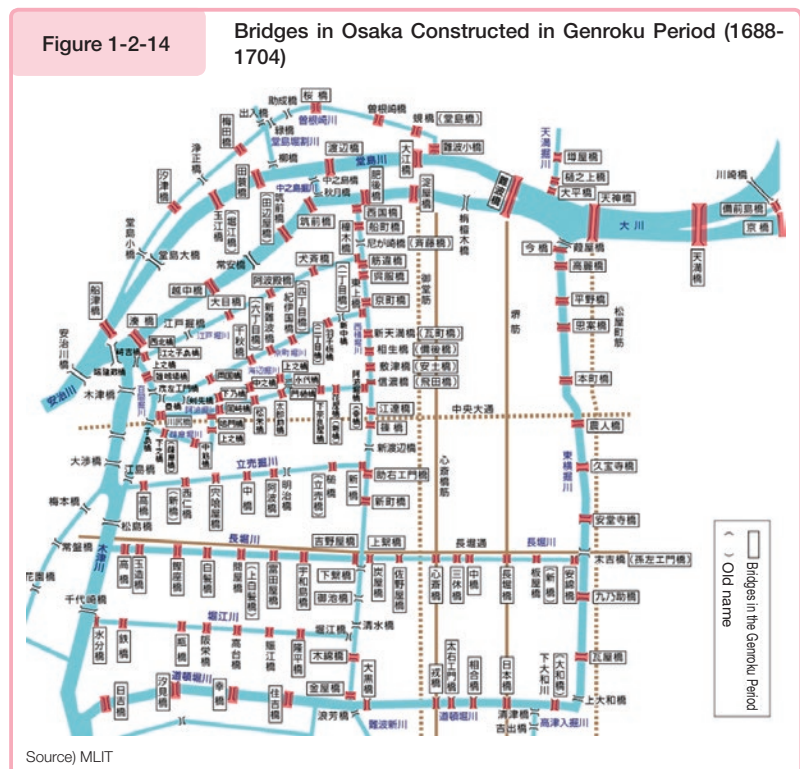
Figure 1-2-13

Scenery of 808 Bridges of Naniwa



Source) National Diet Library

Of four bridges on the Sumida River in the Edo period, Ryogokubashi Bridge, Eitaibashi Bridge, Azumabashi Bridge, and Shin'ohashi Bridge, the Azumabashi Bridge was built in 1774 by six town persons at their own expense by obtaining the approval of the Edo Shogunate, and the other three bridges were constructed by the Shogunate. This indicates that bridges were so indispensable for living and economic activity of town people in Edo that they constructed bridges even by using their own money.



(Infrastructure development and nurturing of disaster prevention awareness by wealthy merchants)

Goryo Hamaguchi, the seventh head of the Hamaguchi family that ran a *shoyu* (soy) sauce production business, predicted the coming of a tsunami to Hiromura (current Hirogawa-cho, Wakayama) right after the Ansei Nankai Earthquake in November 5, 1854, and set a fire on just harvested precious rice to evacuate village people to a hill, which rescued many of them. This is the anecdote known as the Fire of Rice Sheaves.

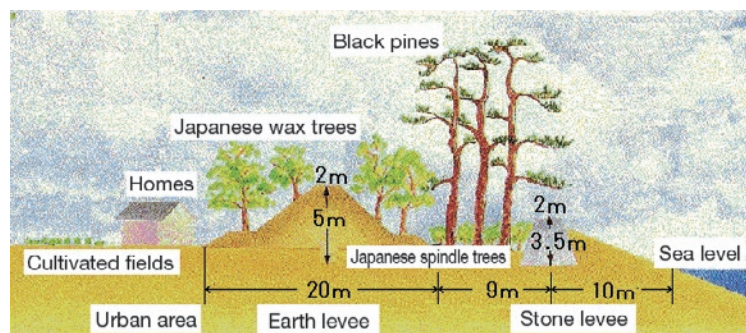
Just three months after the earthquake, Goryo implemented reconstruction measures aimed at two purposes by investing his own money and filing a petition to Kishu domain.

Figure 1-2-15

Bronze Statue of Goryo Hamaguchi and Cross-Sectional Drawing of Hiro Village Breakwater (Hirogawa-cho, Wakayama)



Source) Inamura-no-Hi no Yakata museum



In addition to levee development to prevent future tsunami disasters, measures were also aimed at countering unemployment for villagers who had lost jobs due to the tsunami. The four year construction project resulted in a large-scale breakwater, Hiromura Breakwater, with dimensions 600 m long, 20 m wide and 5 m high, in 1858 (Figure 1-2-15).

The public works project conducted with investment of money by Goryo himself promoted self-support and disaster awareness among villagers, as well as the sense that the breakwater was their asset.

Subsequently, the Hiromura Breakwater was designated as a historic site in 1938, and the breakwater protected many villagers from a tsunami caused by the Showa Nankai Earthquake in 1946, about 100 years after the construction of the

breakwater.

The Hiromura Breakwater still exists in Hirogawa-cho. In 1994, the Hiromura Breakwater Preservation Committee was established, with cleaning activity taking place a few times a year on a regular basis, in which not only the committee members but also children in the neighborhood participate to learn disaster prevention. This represents praises for Goryo's accomplishments as well as continued fostering of disaster prevention awareness among local residents.

Inamura-no-Hi no Yakata museum, which consists of the Goryo Hamaguchi Archives and the Tsunami Educational Center, was opened in 2007 and the facilities communicate the importance of disaster prevention awareness to visitors. In December 2015, the UN General Assembly adopted a resolution to designate November 5, the date when the Ansei Nankai Earthquake hit, as World Tsunami Day, contributing to the fostering of disaster prevention awareness, not only in Japan, but also on a global scale.

(Infrastructure maintenance awareness handed to present time)

The awareness that infrastructure is an asset and it should be maintained by people as in the Edo period is handed down to the present day in some areas, case examples of which are as follows.

Example (i): In Chuo Ward, Osaka-city, conducts the annual event of cleaning bridges in the ward "Bridge Cleaning Brush Up Project" led by the ward office in public and private sector collaboration with local residents, companies, various organizations, and others (Figure 1-2-16).

Figure 1-2-16

Cleaning of Bridges in Chuo-ku by Citizens, Corporations and Various Organizations



Source) Chuo Ward Office, Osaka City

Example (ii): Nihonbashi Bridge, Chuo Ward, Tokyo Metropolis, Nihonbashi Bridge cleaning has been conducted since 1971, hosted by the Nihonbashi-Meikyou (Nihonbashi preservation association), with participation of people from companies, elementary schools, and other organizations in the neighborhood (Figure 1-2-17).

Figure 1-2-17

People Washing Nihonbashi Bridge



Source) Nihonbashi-Meikyou

Example (iii): In Chuo Ward, Niigata-city, Niigata prefecture, a festival to celebrate the birth of Bandaibashi Bridge, a symbol of Niigata-city, is held annually (Figure 1-2-18).

Figure 1-2-18

Bandaibashi Bridge Birth Festival Leaflet and Picture of the Festival



Source) Chuo Ward Office, Niigata-city

Example (iv): The activity of the committee to think about environmental beautification established in 1999 in Saikai-city, Nagasaki prefecture [Note 20](#), is conducting planting and road weeding projects in and out of the region (Figure 1-2-19).

Figure 1-2-19

Road Beautification Activity in Saikai city



Cleaning activity around Oshima-Ohashi Bridge



General education in coordination with elementary schools

Source) MLIT

Column

Development of attractive communities where local activities and infrastructure are combined

Many of the measures implemented by local districts that have received Handmade Hometown Prizes are to revitalize the regions utilizing familiar infrastructures.

Semboku-city, Akita prefecture, is working on Vitalization of the Local District utilizing sediment control facilities, mainly driven by NPO Iyashi-No Keiryu, Sato, Machi Net (healing mountain streams, villages, and town net) (Figure 1-2-20 and 1-2-21). The sediment control dam with large culverts on the Obanaigawa River, completed in 2005, had been planned as a facility, not only to have disaster prevention functions, but also to be friendly to the environment and landscape, and to allow the participation of residents. The universal design of the facility makes it easy for every person to visit and use. The NPO corporation has hosted an event called the Iyashi-De Walk (Walk in Healing) every year since 2005, through which more than 100 people who enjoy walking at the waterside and in the forest, including wheelchair users and kindergarteners, have deepened exchanges among them. In addition, various activities are carried out in the facility to encourage contacts with nature and raise awareness of regional disaster prevention, while the facility serves as the playground for many schools and organizations, and as the place to hold citizens' forums focusing on the environment and disaster.

Figure 1-2-20 Exchanges of Broader People after Introduction of Universal Design for Sediment Control Dam



Source) MLIT

Figure 1-2-21 Kindergarteners Viewing From Above Sediment Control Dam (Playing and Leaning Ground)



Source) MLIT

In Kashima-city, Saga prefecture, since around 1989 when local residents came into action to revitalize the exhausted towns, residents have been making efforts to develop towns utilizing the townscape of Hizenhamashuku [Note](#) dating back to the Edo period (Figure 1-2-22 and 1-2-23). Nowadays, with the NPO

Note In 2006, designated as an important preservation district of historic building in Japan.

Note 20 Won 2015 MLIT Mister Award "Handmade Hometown Prizes." This Award is given by the MLIT Minister to social capital that creates attractions and distinct characteristics of a region and brilliant local activity that utilize it.

Hizenhamashuku Mizu To Machinami No Kai (Society of Water and Townscape in Hizenhamashuku) consisting of volunteers playing a major role, the city is working to promote the tourism industry by hosting concerts or exhibitions, and spreading Sake Brewery Tourism with use of the time-honored sake breweries. As shown by the 70,000 attendants crowding the Kashima Sake Brewery Tourism & Hizenhamashuku Flower and Sake Festival in FY 2015, the city is attracting nationwide attention as an advanced example. The more the city's name is recognized, the more people are relocating to the city, so the NPO corporation is engaged in further Vitalization of the Local District by responding to would-be residents and grappling with the problem of vacant townhouses, one of the issues of the district.

Figure 1-2-22 Hizenhamashuku Flower and Sake Festival (Kashima Sake Brewery Tourism)



Source) MLIT

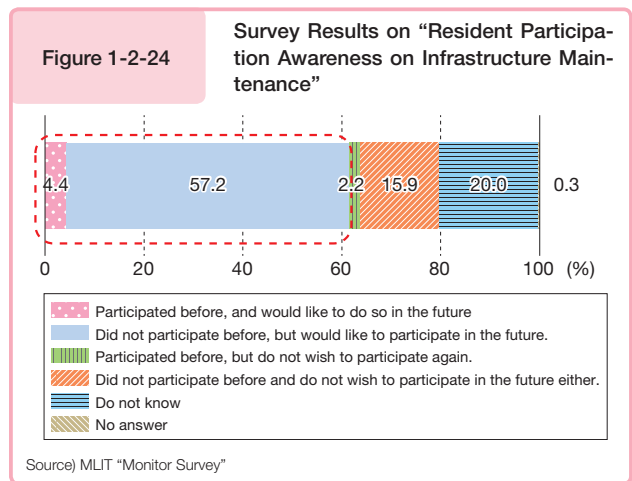
Figure 1-2-23 Events Utilizing Sake Brewery (fashion show by local high school students)



Source) MLIT

(Survey on resident awareness of infrastructure management)

The MLIT conducts Monitor Surveys ^{Note 21}, and a Monitor Survey conducted in February 2016 ^{Note 22} included the following question: “Expansion of cooperation by residents is being examined and tried as an effort to appropriately maintain infrastructures amid declining population and severe fiscal condition. What do you think of such an effort?” A majority of respondents answered, “I have not participated in such activity before, but I would like to do so going forward.” This shows willingness of residents to participate in infrastructure maintenance (Figure 1-2-24).



As explained above, a few hundred years after the Edo period, we can still see that bridges, roads, rivers, running water, levees, and other infrastructures that serve as the foundation of people’s activity are closely connected with the lives and economic activity of local residents.

It is important that each of us lives affectionately with infrastructures and maintain them, not only for now but also for the future to hand them over to the next generation.

In preparing for natural disasters, it is also important for local residents to have disaster prevention awareness (non-

Note 21 A system in place since 2004 of surveying the general public on issues concerning MLIT administration through the Internet to collect high quality opinions, requests, and the like for the purpose of using the results as reference in planning, developing, and implementing land, infrastructure, transport and tourism administration.

Note 22 During a period from Monday, February 8, 2016 to Monday, February 22, 2016, 1098 Men and women aged 20 or over were surveyed on the awareness of resident participation in infrastructure management. The number of respondents was 914 (484 men and 430 women).

structural measures) in addition to infrastructure development (structural measures) as indicated by the example of the Hiromura Breakwater.

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(2) Infrastructure development that supported economic growth after World War II

After the end of the Pacific War in 1945, Japan restored and reconstructed from war damage and showed dramatic economic growth after just 10 years of post-war reconstruction period.

During the high economic growth period, when various infrastructure developments were a pressing task due to rapid population increase mainly in Tokyo, expansion of cities, motorization and the like, the hosting of 1964 Tokyo Olympics was decided. This event required all-out efforts of the nation and large-scale infrastructure development mainly in Tokyo was conducted. This started the enhancement of Japan's rich livelihood infrastructure, from the period of high economic growth until now.

As more than 70 years have passed since the war, we look at the post-war infrastructure development, which is deeply connected to Japan's economic development, as follows.

(Flood control projects)

A series of large-scale typhoons, including Kathleen, hit Japan from the late 1940s to 1950s, causing frequent and significant damage (Figure 1-2-25). After Ise Bay Typhoon in 1959, long-term plans and legislation for flood control projects (10-year plan or five-year plan) were developed for the first time. To counter repeated flood damage, the significance of flood prevention and sediment-related disasters together with flood control became recognized. Also, water resource development, by way of multi-purpose dams for flood control and water utilization, was pushed forward in order to meet rapidly increasing demand for industrial water and municipal water in association with economic development.

At the same time, sudden urbanization caused various river related problems, such as surges in serious water shortages and sediment-related disasters during the high economic growth period. Because of the construction of dams to counter severe water shortages, water supply restrictions were largely decreased in recent years. Furthermore, comprehensive flood control measures including permeation and retention of rainwater together with river improvement and warning and evacuation systems together with countermeasures against debris flows have been conducted.

Figure 1-2-25

Damage by 1947 Typhoon Kathleen (Kuki City, Saitama prefecture (former Kurihashi Town))



Source) MLIT

(Development of main roads)

Because of the task of driving road policies in association with social and economic reconstruction after World War II, the Act on Special Measures concerning Road Construction and Improvement was established in 1952 and the system of toll roads in Japan started. The Act on Temporary Measures concerning Funding of Road Development Expenses was established in 1953, which provided for use of gasoline tax as special revenues for road construction as well as systematic promotion of road development by setting road development goals and project volumes in Five-Year Road Development Programs. The first Five-Year Road Development Program was formulated in 1954.

Roads in Japan after the end of World War II were so severely dilapidated and insufficient that the report of the Watkins Commission published in 1956 warned, “The roads of Japan are incredibly bad. No other industrial nation has so completely neglected its highway system” (Figure 1-2-26).

Five-Year Road Development Programs were formulated until the 11th Five-Year Road Development Program in 1997, contributing to rapid improvement of Japan’s levels of road development.

Figure 1-2-26

Deteriorated Roads Conditions in 1950s
“Watkins Commission Report”



Source) MLIT

(Comprehensive National Development Plan)

The Comprehensive National Development Plan presents medium to long-term land plans in order to establish desirable national land while responding to issues faced by local regions and changing times.

The Plan was reviewed every seven to 10 years since the formulation of the First Comprehensive National Development Plan in 1962, establishing the New Comprehensive National Development Plan in 1969, Third Comprehensive National Development Plan in 1977, the Fourth Comprehensive National Development Plan in 1987, and the Grand Design for the 21st Century in 1998. Under these medium to long-term plans, infrastructure has been developed in line with the needs of the times (Figure 1-2-27).

Figure 1-2-27 First Comprehensive National Development Plan

	First Comprehensive National Development Plan	New Comprehensive National Development Plan	Third Comprehensive National Development Plan	Fourth Comprehensive National Development Plan	Grand Design for the 21st Century
Cabinet decision	October 5, 1962	May 30, 1969	November 4, 1977	June 30, 1987	March 31, 1998
Background	1 Transition to rapidly growing economy 2 Overpopulated city issues and widening income gaps 3 Income doubling plan (Pacific Belt Zone Initiative)	1 Rapidly growing economy 2 Concentration of population and industries in major metropolitan cities 3 Progress in informatization, internationalization, technological innovation	1 Consistently growing economy 2 Signs of decentralization of population and industries 3 Finiteness of land resources, energy and the like that became visible	1 Overconcentration of population and various functions in Tokyo 2 Serious employment problems in regions outside metropolitan areas due to rapid changes in industrial structures 3 Progress of full-scale internationalization	1 Global era (global environmental issues, fierce competition, exchanges with Asian nations) 2 Era of depopulation and aging 3 Era of advanced computerization
Target year	1970	1985	About 10 years from 1977	Around 2000	From 2010 to 2015
Basic goal	Balanced development between regions	Rich environment creation	Development of an integrated human living environment	Multipolar distributed national land building	Laying of groundwork for multiaxial national land structure formation
Development method, etc.	Site-based development method It is necessary to diversify industries to achieve the goal of realizing balanced development between regions. To this end, we facilitate deployment of development bases that relate to the existing concentration areas such as Tokyo and cause them to communicate organically through transportation and communication facilities to influence each other and, at the same time, push forward chain reaction development, leveraging the characteristics of the surrounding areas.	Large-scale development project initiative By establishing transportation networks such as Shinkansen and expressways to drive forward large-scale projects, correct the eccentric use of land and resolve overpopulation/depoulation and regional gaps.	Settlement initiative While restraining the concentration of population and industries in major metropolitan areas, revive other regions to counter overpopulation/depoulation problems, aiming to facilitate balanced use of land in Japan and create a total environment for human inhabitation.	Exchange network initiative Build a multipolar and diversified national land by (i) pushing forward regional development with ingenuity and devices, leveraging regional characteristics, (ii) developing main transportation, information and communications systems by the hand of government or promoting the development across Japan based on the government’s leading guidelines, (iii) creating various opportunities for exchanges in coordination among national and local governments and private sector organizations.	Participation and coordination -Land development with participation by various entities and regional coordination- (Four strategies) 1 Create nature rich residential areas (e.g., small cities, regions of farming and fishing villages, hilly and mountainous areas) 2 Renovate metropolitan areas (Fix, renew and utilize urban spaces) 3 Form regional cooperation corridors (groups of regional coordination on the axis) 4 international spheres of interaction on a large scale (formation of areas with international exchange functions)

Source) MLIT

(Major port and harbor development)

Around the time when the First Comprehensive National Development Plan was formulated, seaside industrial zone, centering on the development of Kashima Port and other industrial ports, was constructed including formation of industrial complex, mainly for the heavy industry, in the Pacific belt zone.

Subsequently, in order to cope with closer international exchanges, international ports including Tokyo Bay, Osaka Bay, and Ise Bay were developed. Also, container transportation appeared in Japan in the late 1960s and developed rapidly to form the current international marine container transportation networks.

(Infrastructure development with hosting of Tokyo Olympic)

The hosting of the 18th Olympics Games in Tokyo was decided by the 56th International Olympic Committee (IOC) General Session held in Munich, West Germany on May 26, 1959.

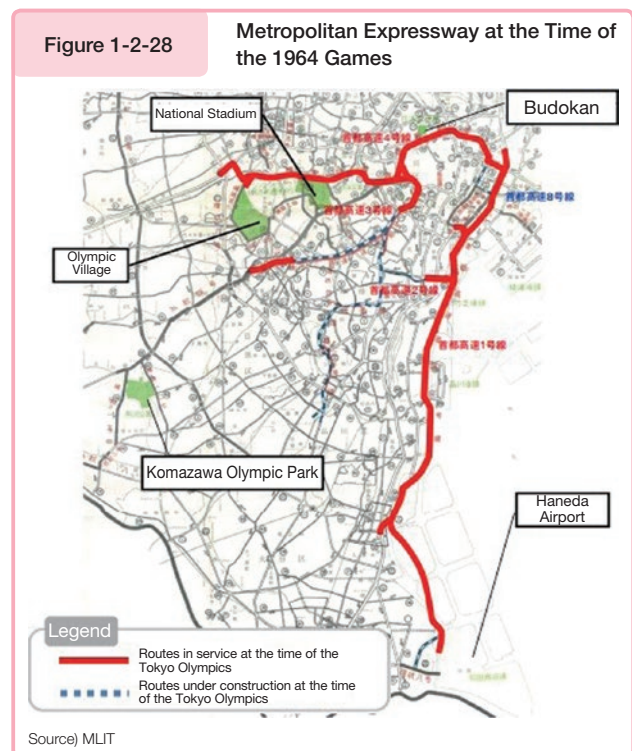
Large-scale infrastructure development was conducted mainly in Tokyo over a five-year preparation period leading up to the 1964 Tokyo Olympic Games (the 1964 Games), which provided many high quality infrastructure developments.

In order to receive Olympians, officials and visitors from in and out of Japan for the Olympic games in which 93 countries and approximately 5,000 players participated during the 15-day period from October 10 to 24, 1964, transportation networks including the Metropolitan Expressway and Tokaido Shinkansen were developed and road networks connecting sports grounds in various locations mainly in Tokyo and Haneda Airport were also established. Also, amid increasingly severe environmental pollution problems at that time, sewage and water supply systems in the Tokyo Area were improved dramatically, and the large-scale infrastructures constructed for the 1964 Olympic are high quality assets of present Japan. The overview of infrastructures constructed is as follows.

■ Olympic related roads and the Metropolitan Expressway

Preparations for the 1964 Games, as infrastructure development to secure transportation between sports grounds in the city center and neighboring prefectures and the Olympic Village became a pressing task; Olympic related roads of 22 lines and to lengths of 54.6 km were developed [Note 23](#).

With regards to the plan and vision of the Metropolitan Expressway, preliminary investigations by Tokyo government started in 1951 and the basic plan was decided and instructed in 1959. However, in order to meet demand for transport between sports grounds in the city center and the Olympic Village, the development of the Metropolitan Expressway was considered indispensable and the construction of five routes (32.9 km) that needed to be built urgently was decided on by the Metropolitan Expressway development committee in December 1960.



Note 23 Radial route No. 4 (Aoyama-dori Avenue, Tamagawa-dori Avenue), radial route No. 7 (Mejiro-dori Avenue), circular route No. 3 (Gaien Higashi-dori Avenue), circular route No. 4 (Gaien Nishi-dori Avenue), circular route No. 7 (Kannana-dori Avenue) were newly established/widened and existing Showa-dori Avenue (radial route No. 12, No. 19) was turned into a multi-level crossing.

Since completion in a short period of time was required, spaces above existing roads, rivers, moats, and water channels were used as much as possible to minimize land purchases. Starting with the opening of route No. 1 (about 4.5 km between Kyobashi and Shibaura) in December 1962, four routes (32.8 km) [Note 24](#) were opened to traffic by the 1964 Games in just five years from the start of planning (Figure 1-2-28).

■ Tokaido Shinkansen (Bullet Train)

Because of economic growth, Tokai-do Line at that time was in a tight supply situation for transportation of both passengers and cargos. Therefore, the study committee on main national railways was established in 1957, which started examining measures to enhance transportation capacity, focusing on Tokaido Line.

The study committee compiled a report in July 1958 and decided that construction of a separate line by AC electric power to enhance transportation capacity of Tokaido Line was necessary, and the Japan National Railways was to manage the new line together with the existing railways.

The dream super express Tokaido Shinkansen, which connected Tokyo and Shin-Osaka (515 km) in about four hours [Note 25](#), started operation in October 1, 1964, in time for the 1964 Games, taking just five and a half years from the construction start in 1959 with construction expenses of 380 billion yen.

The growth of Tokaido Shinkansen has influenced the subsequent development of other New Shinkansen lines. In the wake of Tokaido Shinkansen, the Sanyo, Tohoku, Joetsu, Hokuriku, Kyushu, and Hokkaido Shinkansen lines have been developed in sequence. Shinkansen development has led to further economic growth of Japan.

■ Development of subway

Subway were developed before the war and the line between Asakusa and Ueno [Note 27](#) (about 2.2 km), which was the base of the Ginza Line [Note 26](#), was opened in 1927 as the first subway in the East.

Although Tokyo was hit by air strikes during World War II, the subway suffered relatively small damage compared to other means of transportation.

As post-war reconstruction progressed, population concentrated in Tokyo and securing a means of transportation for commuting to work and schools was an issue. However, Toden streetcars, which were the main means of transportation at that time, were always congested and hopes were put on the development of subway. In 1954, the Marunouchi Line opened between Ikebukuro and Ochanomizu (6.4 km), and Hibiya Line, part of which started operation in 1961, opened the whole line between Nakameguro and Kitasenju (20.3 km) to traffic (Figure 1-2-29) in August 1964, just in time for the 1964 Games.

Figure 1-2-29 Opening of Hibiya Line



Source) Adachi Museum

Note 24 Route 8 (100 m) was not in service at the time of the 1964 Games.

Note 25 Time required when it was opened (about 2 hours and 30 minutes as of March 2016)

Note 26 Ginza Line became the official name in December 1953.

Note 27 The whole Ginza Line was opened in 1939.

■ Tokyo International Airport (Haneda Airport) and Tokyo Monorail

Tokyo International Airport (Haneda Airport ^{Note 28}) was opened as “Tokyo Airport” in 1931 as Japan’s first civil aviation airport. In October 1945 after the end of World War II, however, the Allied Forces banned Japan’s production and operation of aircraft.

The Allied Forces returned most of the facilities in 1952, extension of runways and construction of aircraft parking aprons were conducted in sequence, and the airport was renamed as Tokyo International Airport.

In 1964, overseas travel by Japanese was liberalized and Haneda Airport started such services as an arrival terminal dedicated for domestic flights and former Runway C.

Since the congestion in the area between Haneda Airport and the city center had been a problem and introduction of railway access to the airport was hoped for, the construction of Tokyo Monorail was decided in order to prepare for the 1964 Games successfully.

The construction works started in May 1963 and in just one year and four months, Tokyo Monorail that connects Monorail Hamamatsucho Station, located adjacent to JR Hamamatsucho Station, and Haneda Airport Station, located right under the former Haneda Terminal Building (13.1 km), was opened to traffic on September 17, 1964, just before the opening of the 1964 Games (Figure 1-2-30).

■ Water supply system development

In the 1960s, water-purification facilities were built across Japan, but water demand increased as convenient and comfortable living spread and as the economy grew rapidly. Therefore, water shortages occurred year after year since 1958. An especially severe time of water shortage happened at the time of the 1964 games, called the “Tokyo Olympic Water Shortage” in which water supply in Tokyo was restricted by as much as 50%, severely affecting daily activities of the public, including laundry and cooking at shops and homes, queues waiting for water trucks, and the spread of food poisoning due to deteriorating sanitary conditions (Figure 1-2-31).

After the Tokyo Olympic Water Shortage, a plan to transmit water from Tone River was pushed forward, resulting in water resource development facilities like channels and dams, such as Musashi Channel between Tone River and Arakawa River in 1965, and an extension of water supply pipes was implemented in earnest. On the other hand, water demand continued to increase.

Figure 1-2-30 Opening Ceremony of Tokyo Monorail



Source) Tokyo Monorail Co., Ltd.

Figure 1-2-31 Emergency Water Supply at the Time of Tokyo Olympic Water Shortage



Source) Tokyo Waterworks Historical Museum

Note 28 The official name is Tokyo International Airport and Haneda Airport is a common name.

■ Sewerage system development

In association with population concentration and industrial development, water pollution of public water areas, such as rivers and lakes became severe from around 1955 due to discharged water from homes and factories.

In accordance with the so-called “36 report” submitted in 1961 by the Tokyo city planning special sewerage system investigation committee, medium and small-sized rivers severely polluted by discharged water from factories and homes were covered and Shibuya River was covered in 1964 located near the 1964 games fields (Figure 1-2-32).

Subsequently, with the revision of the Sewerage Service Act in 1970, sewerage systems served important roles of preserving water quality of public water areas in addition to making cities clean.

(Succession of Olympic legacy)

As described above, large-scale infrastructure development took place leading up to the 1964 Games. For the 2020 Tokyo Olympics and Paralympic Games, games will be conducted in the Heritage Zone, which includes venues constructed for the 1964 Games, and the Tokyo Bay Area Zone, to be newly constructed mainly in bay areas.

The construction of the Olympic Village to be established in the Harumi area (Chuo Ward, Tokyo), has already started with participation of private-sector business operators.

The coastal region reclaimed in the Edo period is booming on the back of expectations for improved convenience of life due to infrastructure development for the hosting of the 2020 Games [Note 29](#).

Edo, which was called a water city, had active water transportation and the revitalization of water transportation, such as touring and restaurant ships from Tokyo Port and rivers, will be promoted for the 2020 Games.

As for road development in consideration of the 2020 Games, National Route 357 Tokyo Bay Tunnel was opened in March 2016, and a walking event was held one week before the opening. Road development will be conducted in sequence by the 2020 Games.

Figure 1-2-32

Shibuya River under Covering Construction



Source) Shibuya Folk and Literary Shirane Memorial Museum *Regional history told by Shibuya River Haru-no-Ogawa*

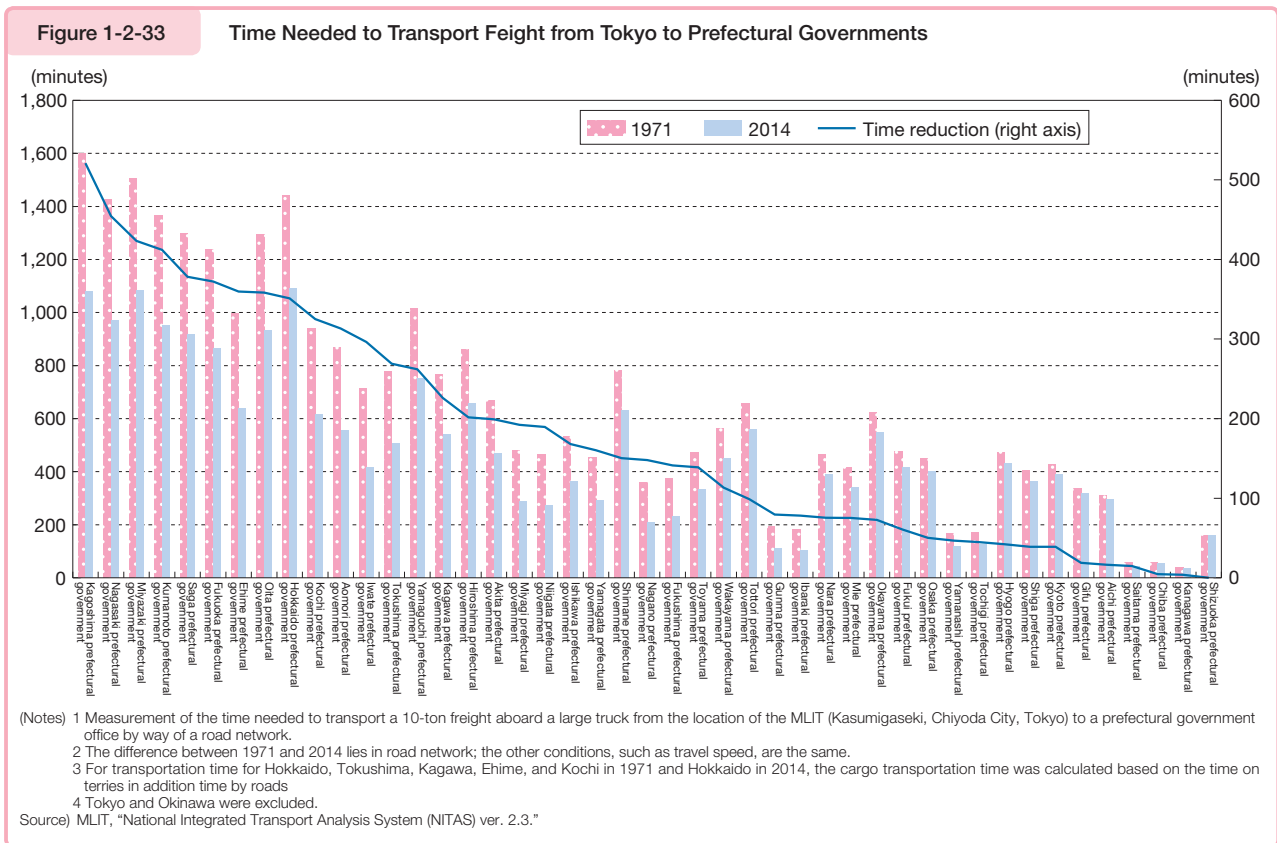
Note 29 For example, residential land of Chuo Ward, Tokyo rose 9.7% in “2016 official land price” from the previous year.

(Upholding economic growth through infrastructure development)

As described above, post-war Japan implemented large-scale construction of social infrastructure, which serves as the foundation of our lives today, and thereby supported not only people’s lives but also the economy.

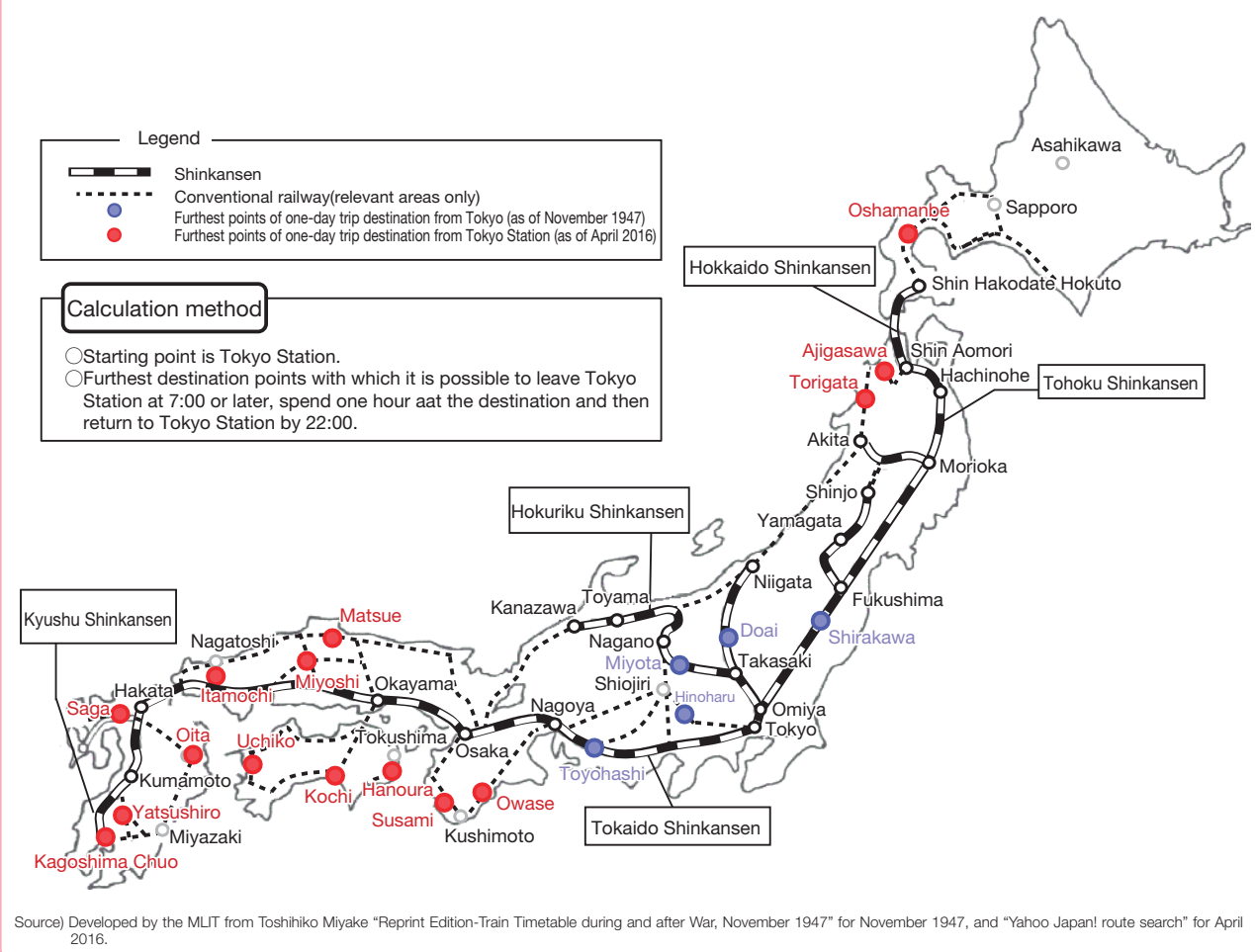
Transit times trimmed by the development of transportation networks offer an easy-to-understand example of the economic effects brought by infrastructure development.

When comparing times needed to transport freight from the MLIT office (Tokyo) to prefectural governments in over the 40 years from 1971 to 2014, the time needed is reduced by up to 500 minutes (Figure 1-2-33).



Also, we can see that the area of one-day round trip from Tokyo by railway expanded dramatically during a period from 1947, right after the World War II, to now (Figure 1-2-34).

Figure 1-2-34 One-Day Trip Zone from Tokyo Station by Railway



Obviously, enhanced transportation networks resulting from the development of express highways, express railways, and the like have cut the transit times drastically. Such infrastructure development supported Japan's economic growth to become one of the world's biggest economies.

As described above, infrastructure development by Ieyasu Tokugawa centered around Edo Castle in the Edo period was the base of current Japan. Also, various infrastructures that support Japan's economic activities nowadays were constructed in the period of war reconstruction and high economic growth period.

Infrastructure constructed in the past exists as legacy assets, and has greatly contributed to the economic growth of Japan.

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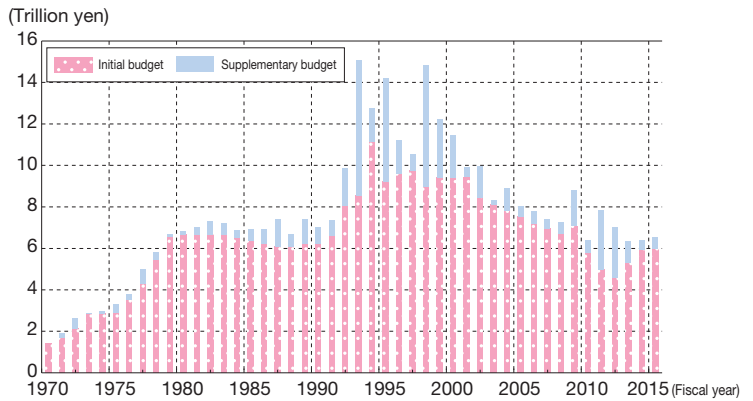
(3) Changes in infrastructure investment

(Changes in public works-related expenses (general account))

After the surge in the 1970s, public works-related expenses stayed flat in 1980s and then got back on a rising trend, peaking in the mid-to-late 1990s before declining, and have been almost flat since around 2013 (Figure 1-2-35).

Figure 1-2-35

Changes in Public Works-Related Expenses (General Account)



(Note) Expenses relating to restoration and reconstruction from the Great East Japan Earthquake are recorded in special account for the Great East Japan Earthquake from 2012 and not included in public works-related expenses.
 (Source) Developed by the MLIT from MOF "Fiscal Statistics"

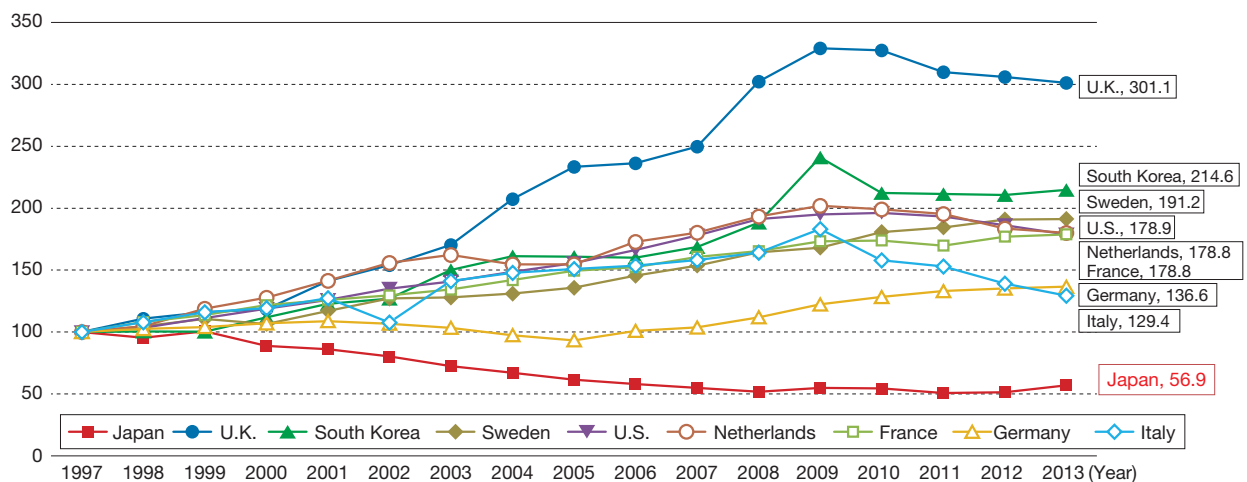
(International comparison of infrastructure standards)

Comparison between Japan's public investment trends with that of other countries is as follows.

Changes in gross general government general fixed capital formation, having 1997 figure as baseline, indicate that while other major OECD countries are on an increasing trend, only Japan shows continued declines and is hovering at around 50 in recent years (Figure 1-2-36).

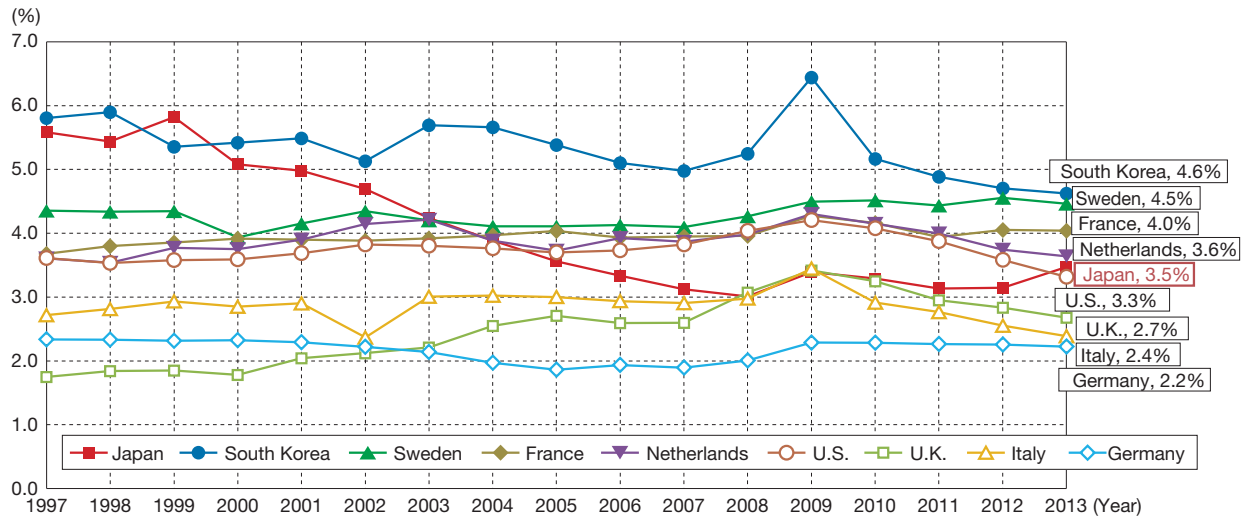
Also, the ratio of gross general government fixed capital formation to GDP for each year shows that Japan's level of investment was high compared to other nations in late 1990s but has been at the same levels as other major developed countries since 2000 (Figure 1-2-37).

Figure 1-2-36 Changes in General Governmental Public Fixed Capital Formation (1997 = 100)



(Notes) 1 All values indicated are normal.
 2 For the U.K. in 2005, the effect of the assumption of the assets and debts of British Nuclear Fuels Limited (BNFL) by the central government (approximately 14 trillion pounds) are excluded.
 3 Since there is no available data for gross fixed capital formation of Germany and France (from 1997 to 2008), gross capital formation data is used for all years.
 4 Data based on O8SNA for Japan and data based on 93SNA for other nations.
 (Source) Developed by the MLIT from OECD Stat. Extracts "National Accounts" for countries other than Japan and from "Fiscal 2014 National Accounts (2005 basis, 93SNA)" (Authentic Information) compiled by the Cabinet Office for Japan.

Figure 1-2-37 Charges in the Ratio of Public Investment (Ig/GDP) in Major Advanced Nations



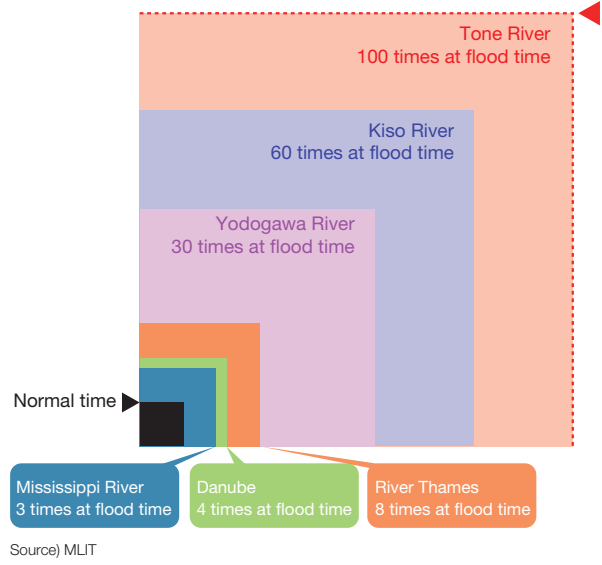
(Notes) 1 All values indicated are normal.
 2 For the U.K. in 2005, the effect of the assumption of the assets and debts of British Nuclear Fuels Limited (BNFL) by the central government (approximately 1.4 billion pounds) are excluded.
 3 Since there is no available data for gross fixed capital formation of Germany and France (from 1997 to 2008), gross capital formation data is used for all years.
 4 Data based on 08SNA for Japan and data based on 93SNA for other nations
 (Source) Developed by the MLIT from OECD Stat. Extracts "National Accounts" for countries other than Japan and from "Fiscal 2014 National Accounts (2005 basis, 93SNA)" (Authentic Information) compiled by the Cabinet Office for Japan.

(Poor land and severe natural conditions that are expensive)

As described above, when looking at Ig/GDP ratio, Japan's public investment amount is at the same level as those of major OECD member countries; however, it is difficult to determine whether the level is high or low by comparing nations that have different territorial structures and are in different stages of infrastructure development.

As Japanese rivers are precipitous and short, their flow suddenly increases at times of heavy rains. While comparison of normal time flow and flood time flow shows that the increase is eight times for the River Thames, four times for the Danube and three times for the Mississippi River, that of Japanese rivers generally changes significantly—100 times for Tone River, 60 times for Kiso River, and 30 times for Yodogawa River (Figure 1-2-38).

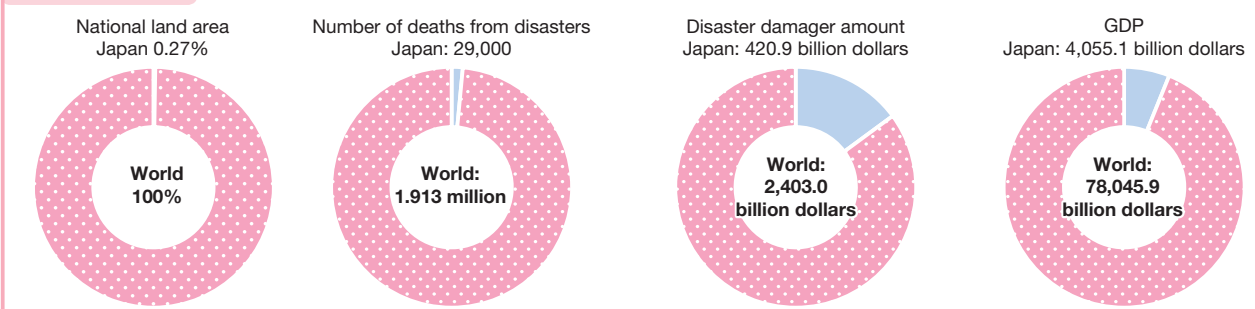
Figure 1-2-38 Flow Comparison Between Flood Time and Normal Time



Source) MLIT

Figure 1-2-41

Japan's National Land Area, Number of Deaths from Disasters, Disaster Damage Cost, and GDP in the World

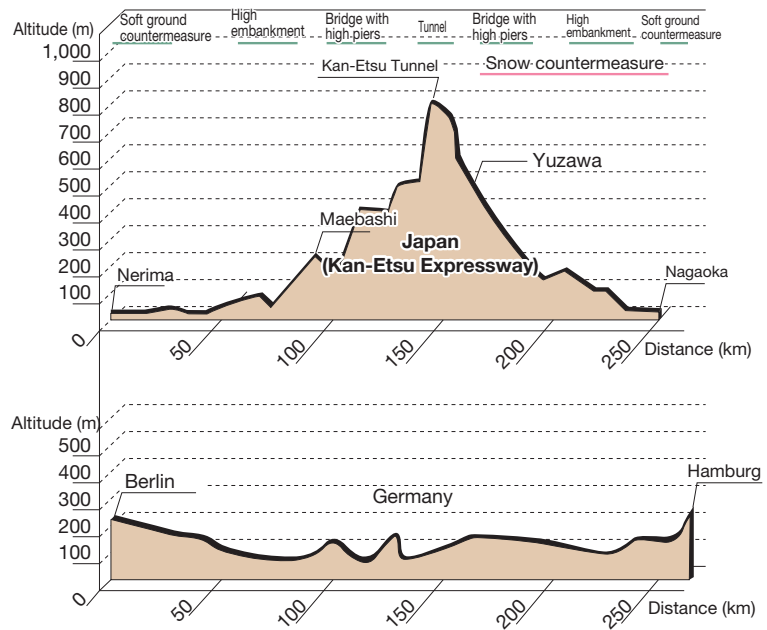


(Note) Numbers of deaths and disaster damage amounts are 1984-2013 total; land area and GDP figures are of 2014 data. Source) Developed by the MLIT from Cabinet Office "2014 White Paper on Disaster Management" and MIC "World Statistics 2016"

Also, in terms of landform, Japan has a high ratio of structures including bridges and tunnels compared to other nations (Figure 1-2-43) to deal with steep landforms with many mountains and rivers (Figure 1-2-42).

Figure 1-2-42

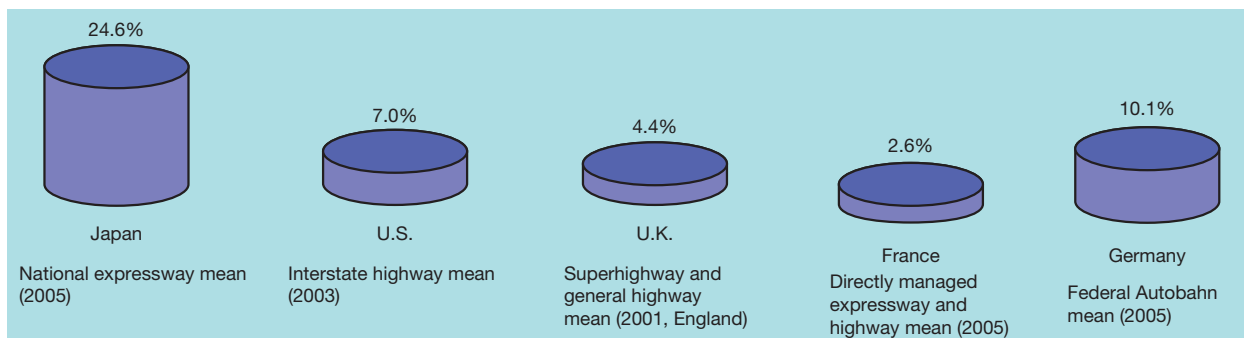
Difference in Landform between Japan and Germany and Expressways



(Note) As of 1998 Source) Topographical map of the Geospatial Information Authority of Japan, Michelin "Motoring Atlas Europe"

Figure 1-2-43

Comparisons of the Proportion of Structures by Country



(Note) Proportion of structures = (Bridge beam length + Tunnel length)/Total length Source) Survey by Infrastructure Development Institute

Since Japan needs to adopt construction methods that take into consideration its specificity based on such harsh natural and land conditions, it tends to incur larger costs for infrastructure development compared to other nations. Therefore, caution must be exercised when comparing public investment amounts of Japan with those of other nations.

2 Current Status of Infrastructure Development and Aging

(Comparison of infrastructure development of major countries)

Although harsh natural and land conditions of Japan compared to other nations make it difficult to make appropriate comparisons, in the area of flood control, levee control coverage is low compared to the levels of other nations at about 69% (Figure 1-2-44). Since heavy rains have caused flood damage in recent years, infrastructure development, including robust infrastructures, is considered necessary going forward.

Figure 1-2-44 Infrastructure Development Status of Major Countries

Area	Japan			Status of Other Nations			
	Indicators	Current level	Target in early 21st century	U.K.	Germany	France	U.S.
Sewerage	Sewage treatment population dissemination rate ^{Note 1}	77.6% ^{Note 2} (End of FY 2014)	—	97% (‘10)	96% (‘07)	82% (‘04)	74% (‘07)
	Cities with population of 1 million or more	99.1% ^{Note 2}					
	Cities with population of less than 50,000	49.6% ^{Note 2}					
City parks	Per capita area covered by urban plans	Japan 10.2 m ² Tokyo 4.4 m ² (End of FY 2014)	About 20 m ²	26.9m ² London (‘97)	27.9m ² Berlin (‘07)	11.6m ² Paris (‘09)	52.3m ² Washington D.C. (‘07)
	Per capita floor area ^{Note 3}	39m ² (‘13)	—	46m ² (‘13)	46m ² (‘10)	44m ² (‘06)	61 m ² ^{Note 4} (‘13)
Home	Floor area per home ^{Note 3}	94m ² (‘13)	—	96m ² (‘13)	101m ² (‘11)	100m ² (‘06)	131m ² (‘13)
	Owner-Occupied houses	122m ²	—	103m ²	130m ²	120m ²	157m ²
	Rental Housing	46m ²	—	68m ²	78m ²	74m ²	114m ²
Roads	Arterial High-Standard Highways Extension ^{Note 5}	11,050 km (End of FY 2014)	Almost completed 14,000 km network	3,641km (‘13)	12,917km (‘13)	11,552km (‘13)	103,029km (‘13)
	National High-Grade Trunk Highways extension per 10,000 units	1.40 km (End of FY 2013)	—	1.08km (‘12)	2.69km (‘12)	3.01 km (‘12)	4.15km (‘12)
	Total road length (width: 5.5 m or above) ^{Note 6}	341,509 km (End of FY 2012)	—	420,346km (‘12)	643,517km (‘12)	1,062,683km (‘12)	6,539,718km (‘12)
	Road density ^{Note 6}	0.90 km/km ² (End of FY 2012)	—	1.73km/km ² (‘12)	1.80km/km ² (‘12)	1.94km/km ² (‘12)	0.67km/km ² (‘12)
Flood control	Flood Control Safety Goals ^{Note 7}	1/200	—	1/1,000	—	1/100	About 1/500
	Levee development coverage ^{Note 8}	Arakawa River About 69% (As of March-end 2016)	—	River Thames (Storm surge) Complete (‘83)	—	Seine Complete (‘88)	Mississippi River Downstream levee Development coverage About 93% (‘11)
Railway	Rate of Congestion	165% Tokyo Area (FY 2014)	By 2020 150%	149% London (‘91)	—	152% Paris (‘91)	71% New York (‘91)
Aviation	Airport development status (number of runways) in world's major metropolitan areas ^{Note 9}	Tokyo Narita 2 Haneda 4 Total 6	Tokyo Narita 3 ^{Note 10} Haneda 4 Total 7	London Heathrow 2 Gatwick 2 Stansted 1 Luton 1 City 1 Total 7 (‘13)	Berlin Tegel 2 Schönefeld 1 Total 3 (‘13)	Paris Charles de Gaulle 4 Orly 3 Total 7 (‘13)	New York JFK 4 Newark 3 LaGuardia 2 Total 9 (‘13)
		Osaka Kansai 2 Itami 2 Kobe 1 Total 5	Osaka Kansai 2 Itami 2 Kobe 1 Total 5	—	—	—	—
Ports and harbors	Quay of 16 m water depth level in service (number of berths) ^{Note 11}	12 ^{Note 12} (‘15)	—	3 (‘15)	23 ^{Note 13} (‘15)	6 ^{Note 12} (‘15)	20 ^{Note 13} (‘15)

(Notes) 1 Status of foreign countries are quoted from OECD ENVIRONMENTAL DATA COMPENDIUM

2 FY 2012-end is excluded because there were municipalities that could not be surveyed in Fukushima due to the effects of the Great East Japan Earthquake.

The end of FY 2012 sewage treatment population dissemination rate for Japan is the figure of 46 prefectures after excluding Fukushima.

3 The floor area is adjusted to a calculation from the center of walls where such adjustment is possible (Germany and France × 1.10, U.S. × 0.94).

4 The floor space of the U.S. is median value and detached houses and mobile homes are in the scope.

5 Japan: national high-grade trunk highways, U.K.: motorways, Germany: autobahn, France: auto routes, U.S.: interstate highways, other freeways and expressways.

6 Total road length (width: 5.5 m or more) and road density data are quoted from WORLD ROAD STATISTICS 2012 (IRF).

7 The annual probability of flood overrun targeted for water control facilities. However, the data is the annual probability of tidal wave overrun for the River Thames.

8 The ratio of levees constructed to those required under river improvement plans.

9 According to the latest AIP Aeronautical Information Publication.

10 With respect to crosswind runways, based on the conclusion of a round-table discussion, it will be proposed to regions after investigating environmental impacts and the like upon completion of parallel runways. Until then, it will be developed as surface roads.

11 Values organized by the MLIT from websites of ports, Containerization International Yearbook, and other materials.

12 Some data include the number of berths whose water depth is less than 16 m and provisionally in service.

13 Because of data restrictions, some data include the number of berths whose water depth is less than 16 m.

Source) MLIT

(Aging social infrastructures)

In Japan, those infrastructures that have been built after the period of rapid economic growth, including Tokyo Metropolitan Expressway Route 1 which was laid after the 1964 Tokyo Olympic Games, are forecast to get need replacement simultaneously in the future, with the proportion of facilities that will reach 50 years of age or older in 20

years to increase at an accelerating pace.

As described in Section 1, fiscal condition of Japan is expected to become severer as the population declines and ages, but renewal expenses estimated at about 3.6 trillion yen for FY 2013 are expected to increase by about 30% to 50% to 4.6-5.5 trillion yen in 20 years' time (Figure 1-2-45).

The MLIT developed aging countermeasures, marking 2013 as the Starting Year of Infrastructure Maintenance Activity. In November of the same year, the Basic Plan for Life Extension of Infrastructure by government was formulated, and relevant ministries are developing action plans starting with the MLIT's Action Plans for Life Extension of Infrastructure established in May 2014. Also, municipalities are formulating action plans for a period through FY 2016.

We need to ensure strategic maintenance so that we can balance securing the safety of existing social infrastructure and reduction and leveling of total costs through execution of the plans.

Figure 1-2-45 Maintenance and Renewal Expenses and Aging of Social Infrastructure

Estimated Costs of Maintenance/ management and renewal		Present Status of Aging Social Infrastructures		
Fiscal year	Estimated result	<<Percentage Ratios of Social Infrastructure over 50 Years Old>>		
		March 2013	March 2023	March 2033
FY 2013	About 3.6 trillion yen			
FY 2023 (In 10 years' time)	About 4.3-5.1 trillion yen			
FY 2033 (In 20 years' time)	About 4.6-5.5 trillion yen			
<p>*1. The number of facilities falling in each of the 10 fields of social infrastructures (roads, flood control, sewer systems, ports and harbors, public housing, parks, coasts, airports, aids to navigation, governmental facilities) over which the MLIT has jurisdiction and that are managed by the state, local public entities Regional Road Public Corporations or Japan Water Agency, an incorporated administrative agency, has been checked by year of initial construction for estimation, with records of their maintenance/management, renewal, etc. taken into account.</p> <p>*2. New construction and removal are not considered because they are difficult to estimate.</p> <p>*3. Regarding functional improvements when renewing facilities, the assumption is to renew with similar functions (however, improvements to meet quake-resistance standards and the like are included).</p> <p>*4. It does not include the land cost and compensation cost, natural disaster relief expenditure</p> <p>*5. Since maintenance and renewal unit cost and renewal timing vary among social infrastructures for such reasons as differences in the degree of damage stemming from different location conditions of facilities, the estimations are shown as ranges.</p>		<p>Highway bridges [About 400 thousand bridges ^{Note 1)}(of 700 thousand bridges at least 2m long)]</p> <p>Tunnel [About 10 thousand tunnels ^{Note 2)}</p> <p>River management facilities (such as sluices) [About 10 thousand facilities ^{Note 3)}</p> <p>Sewerage pipes [Total length: about 450 thousand km ^{Note 4)}</p> <p>Harbor quays [About 5 thousand facilities ^{Note 5)}(at least 4.5 m in water depth)]</p> <p>Note 1) About 300,000 bridges whose year of construction is unknown have been excluded from the ratio calculations. Note 2) About 250 tunnels whose year of construction is unknown are excluded from the calculation of ratios. Note 3) Government-managed facilities only, including about 1,000 facilities whose year of construction is unknown. (Since the facilities developed within the last 30 years generally have a documented history, the facilities whose year of construction is unknown have been sorted as being 50 years or older.) Note 4) The figure includes approximately 15,000 km whose year of construction is unknown (since pipes laid within the past 30 years generally have records, pipes whose year of construction is unknown are treated as those aged 30 years or over and their length proportionally distributed in the ratio of construction by documented number of years elapsed.) Note 5) About 100 quay facilities whose year of construction is unknown are excluded from the calculation of ratios.</p>		

Source) MLIT

3 Relationships with Infrastructure and Productivity, moving toward a productivity revolution

The MLIT will make all-out efforts on productivity revolution, positioning 2016 as the Starting Year of Productivity Revolution. We examine the effects that land, infrastructure, transport and tourism administration, especially infrastructure, have on productivity and economic growth.

The effect of infrastructure development consists of flow and stock effects. Flow effect is the short-term effect of expanding the overall economy as public investment projects create economic activities including production, employment, and consumption. Stock effect is the medium- to long-term effect that continues as infrastructures are accumulated and function as social overhead capital, which includes various effects, such as productivity improvement. Up until now, the focus when discussing effects of public investment tended to be short-term flow effect; however, it is important to look at the inherent stock effect of infrastructures. Stock effects will be explained in more details in chapter 2.

Column

Has the multiplier effect been diminishing?

There is a multiplier effect as one of flow effects of public investment. The multiple effect means that not only the public investment becomes a final demand and expands the economy, but also the increase in public investment influences consumer spending, etc. and boosts GDP in the end (Figure 1-2-46).

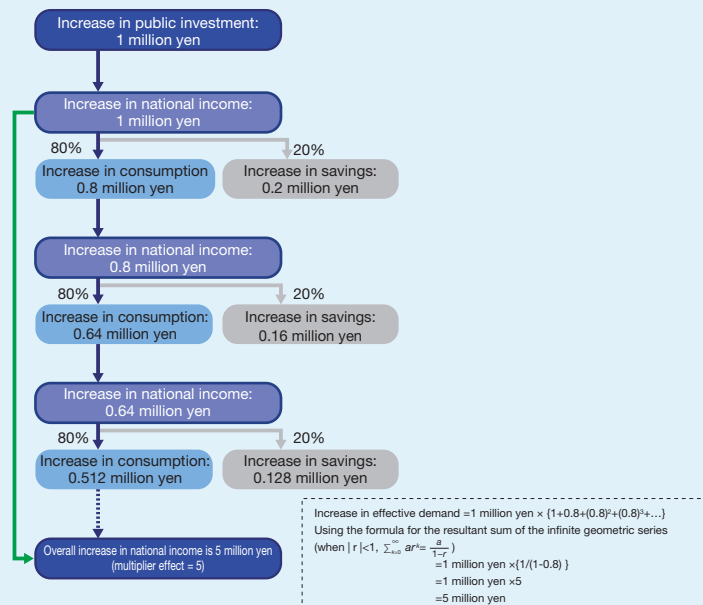
It is sometimes said that the multiplier effect is representative of the economic effects of public investment, but the multiplier effect originally refers to merely the things generated in the process in which the amount of public investment increases employee incomes, eventually leading to a rise in consumption. That is, the multiplier effect is different from the production inducement effect [Note 1](#) caused by public investment, and does not include the economic effects gained from the combined use of the infrastructure at all. We need to pay attention to these points.

As for this multiplier effect, it is said that the figure has been falling in recent years, but there are indications that in the macro-econometric model in the early 70s and earlier, the importance of the supply block and financial block was not recognized, so the model was constructed in which multiplier controls by price hikes or financial aspects were not counted at all, and the comparison of the multipliers in the same structure models in the 80s and 90s showed almost no change in the multipliers (theses by persons involved in the development of the models in the former Economic Planning Agency [Note 2](#)).

Note 1 The effect refers to when an investment is made in a part of the industry sector, not only production of the relevant industry sector increases, but also through procurement of raw materials and equipment, the effects influence other industry sector directly or indirectly, and cause a rise in their production.

Note 2 Masahiro Hori, Susumu Suzuki, and Osamu Kayasono (1998) "Tanki nihon keizai makuro keiryō moderu no kozo to makuro keizaiseisaku no koka" ["The structure of macro-econometric model in the short-term Japanese economy and the effects of macro economy policies"]. Economic Research Institute, Economic Planning Agency. *Economic Analysis*, 157.

Figure 1-2-46 Flows o Multiplier Effect (image)



Source) Developed by the MLIT from Tsutomu Miyagawa, Miho Takizawa (2011) "Graphic Macro Economics 2nd Edition"

(Productivity is the key to economic growth)

There are three factors that create economic growth: (i) labor, (ii) capital, and (iii) total factor productivity (TFP) [Note 30](#).

Note 30 This is defined as "balance after excluding contribution of labor input and capital input from the growth in total production" and specifically includes changes in technological innovation and resource allocation, as well as qualitative changes in labor or capital (e.g., enhanced ability of laborers through training, capital investment in cutting-edge information technologies).

The analysis of economic growth of Japan by growth accounting [Note 31](#) shows that contributions of capital and TFP were larger than those of labor (Figure 1-2-47).

Also, comparisons between the GDP growth rate and the rate of increase in labor force during the period from 1956 and 1970, in the high economic growth period, show that the average annual rate of increase in labor force was only about 1.4% compared to the average annual growth rate of about 9.6% for real GDP, and it reveals that the rapid growth did not depend on the increase of labor force only

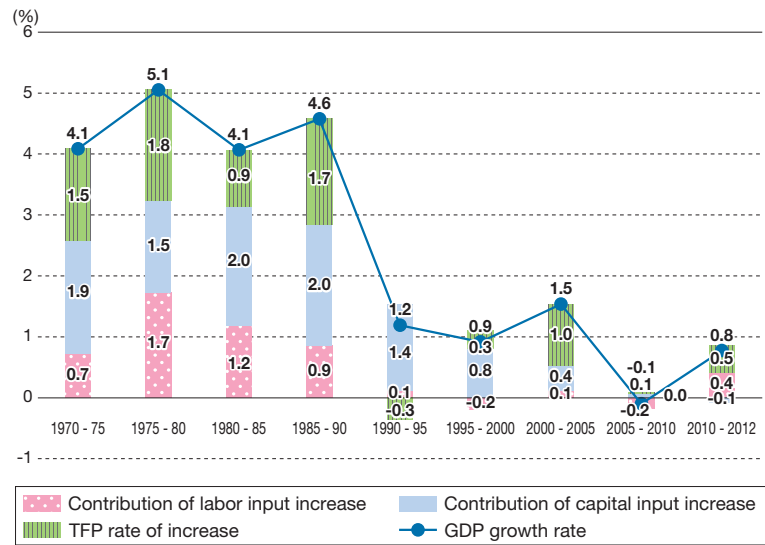
[Note 32](#). While productive-age population, which constitutes the labor force, is expected to decrease by close to 1% annually during the 20-year period until 2030, the above data indicates that it is possible to achieve economic growth with the declining population going forward

if the decrease in labor force can be compensated by capital accumulation and productivity improvement [Note 33](#). Therefore, it is important to be conscious of productivity on the condition of ensuring security and safety in order to support economic growth going forward.

(Productivity Revolution Projects)

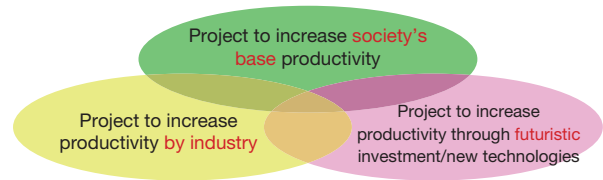
The MLIT is working on productivity improvement through individual projects from three approaches: (i) projects for increasing society’s base productivity, (ii) projects for increasing productivity by industry, and (iii) projects for increasing productivity through futuristic investment/new technologies (Figure 1-2-48).

Figure 1-2-47 Changes in Growth Accounting



Source) Developed by the MLIT from Research Institute of Economy, Trade and Industry “JIP Database 2015”

Figure 1-2-48 Productivity Revolution Project (Three Approaches)



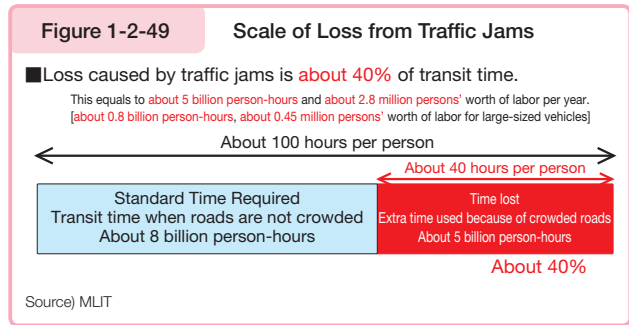
Source) MLIT

Note 31 Growth accounting is a technique by which the sources of economic growth are broken down into an increased capital stock, increased labor population, and higher TFP to determine quantitatively which of the three sources contributes most to the economic growth. Assuming a Cobb-Douglas production function based on Y : GDP, A : technology level, K : capital stock, L : labor quantity, α : capital share and $1-\alpha$: labor share, GDP can be stated in an equation as $Y = AK^\alpha L^{(1-\alpha)}$. After taking the log of both sides and differentiating with respect to time, it will be stated as $\frac{\dot{Y}}{Y} = \frac{\dot{A}}{A} + \alpha \frac{\dot{K}}{K} + (1-\alpha) \frac{\dot{L}}{L}$ (Y, A, K, L is respectively differentiated with respect to time) and GDP growth rate can be resolved into three elements: technological advancement, increase in capital stock, and growth in labor force.

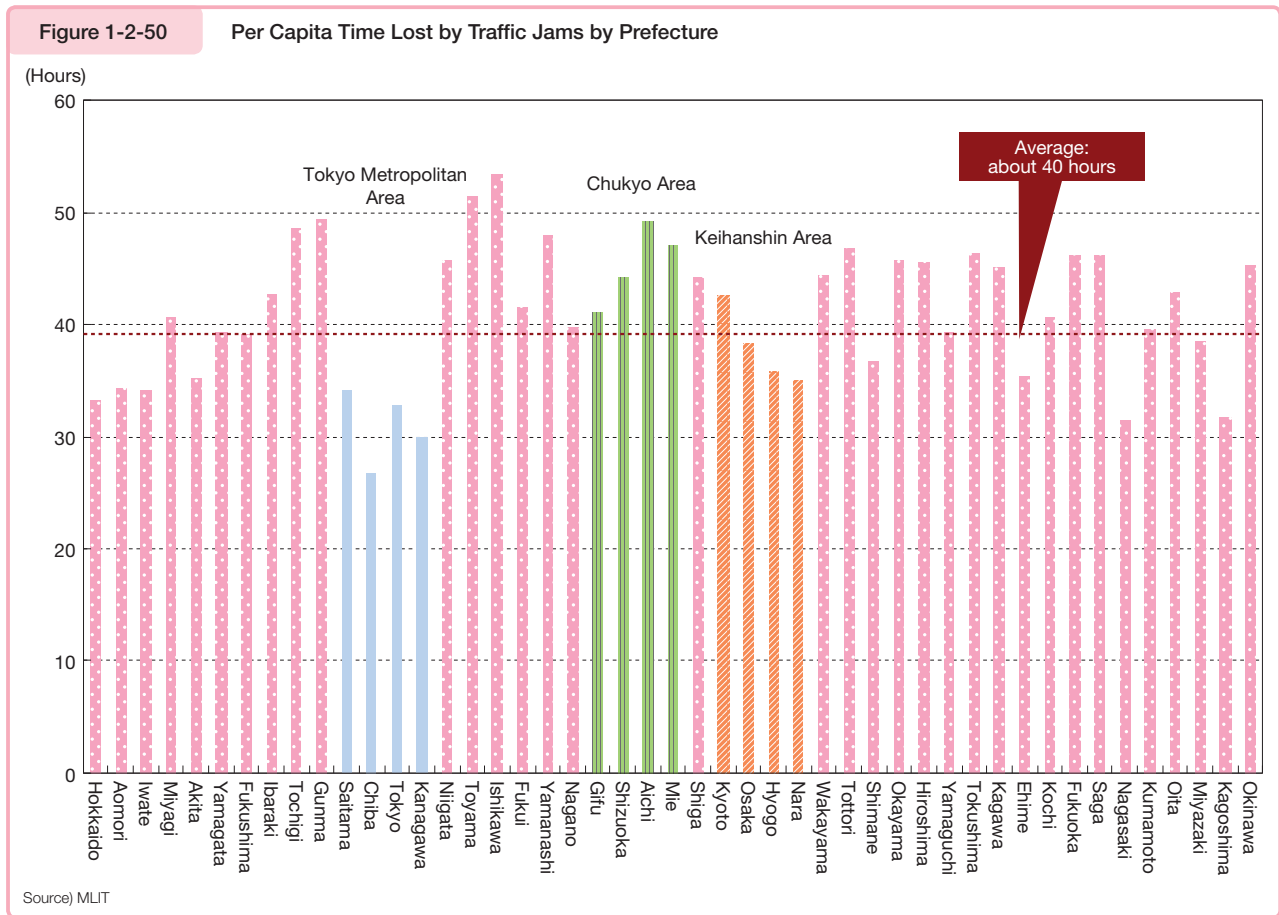
Note 32 Calculated based on “Japanese Economy 2014-2016” by the Cabinet Office, and “2005 Trade White Paper” by the Ministry of Economy, Trade and Industry.

Note 33 According to the estimates by the selective future committee (Figure 1-1-4), even with population declines, there will be about a 1% difference in real GDP growth rates between the production increase scenario and the flat productivity scenario.

For example, if we look at the projects for increasing society's base productivity, Japan's economic society has many inefficiencies and wastes. Specifically, as shown in Figure 1-2-49, about 40% of road transit time is spent in traffic jams, which equals to annual labor force of about 2.8 million persons.



Since large losses from traffic jams occur also in local regions as well as urban areas, according to the time lost in traffic jams by prefecture per population, it is thought that the resolution of losses from traffic jams will lead to productivity enhancement not only in urban areas, but also across Japan (Figure 1-2-50). Therefore, efforts to enhance society's base productivity, which draw regional potentials to increase productivity of society as a whole, are important.



Column

Project of productivity revolution 13



The Ministry of Land, Infrastructure, Transport and Tourism (MLIT), in order to promote strongly and collectively its measures for productivity revolution, has established the head office for the revolution within the ministry and is taking measures.

The MLIT has publicized projects that are expected to bring about a certain effect on productivity improvement and are sufficiently matured. As of April 2016, 13 projects have been published.

- “Society bases”
 - (i) Pinpoint measures and (ii) wise tolls to solve traffic congestion
 - (iii) Ports and harbors in the new age of cruises
 - (iv) “Compact” and “Network”
 - (v) Optimal utilization of lands and real estates

- “By industry”
 - (i) Construction industry, i-Construction
 - (ii) Housing and lifestyle industry
 - (iii) Shipbuilding industry, i-Shipping
 - (iv) Distribution industry
 - (v) Truck transportation industry
 - (vi) Tourism industry

- “Future oriented”
 - (i) Scientific road traffic safety measures
 - (ii) Overseas development of high-quality infrastructures considering growth cycles

Some projects are introduced here in some detail (Figure 1-2-51, 1-2-52, and 1-2-53).

Figure 1-2-51 “Society’s Base” (iv) “Compact” and “Networks”

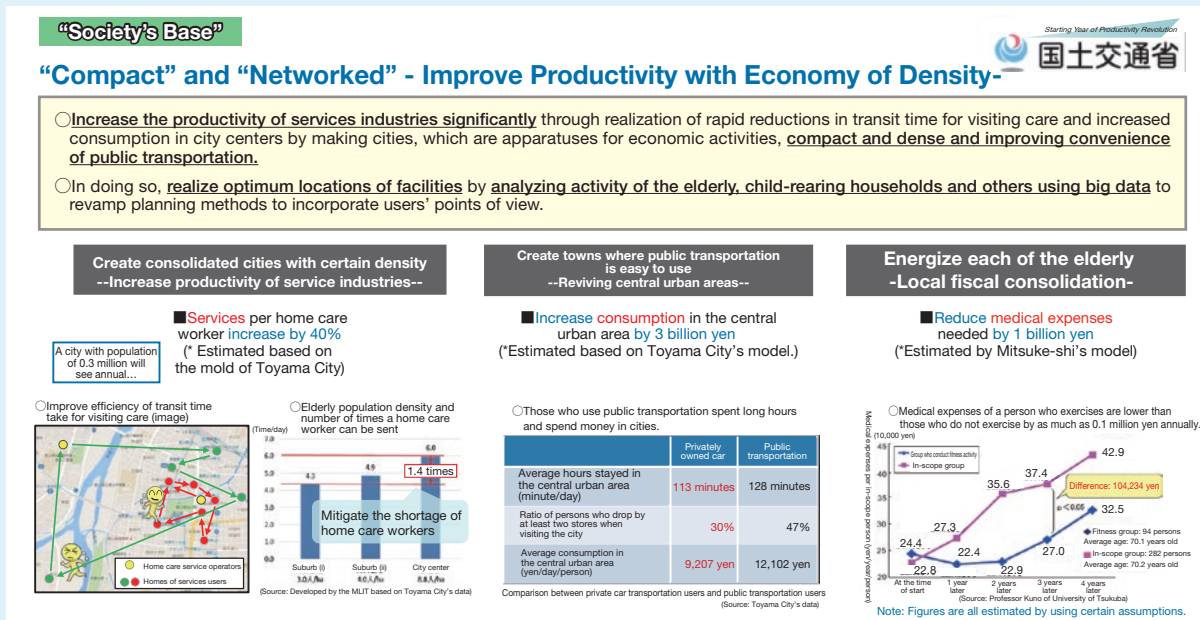


Figure 1-2-52 "By Industry" (iii) Shipbuilding i-Shipping

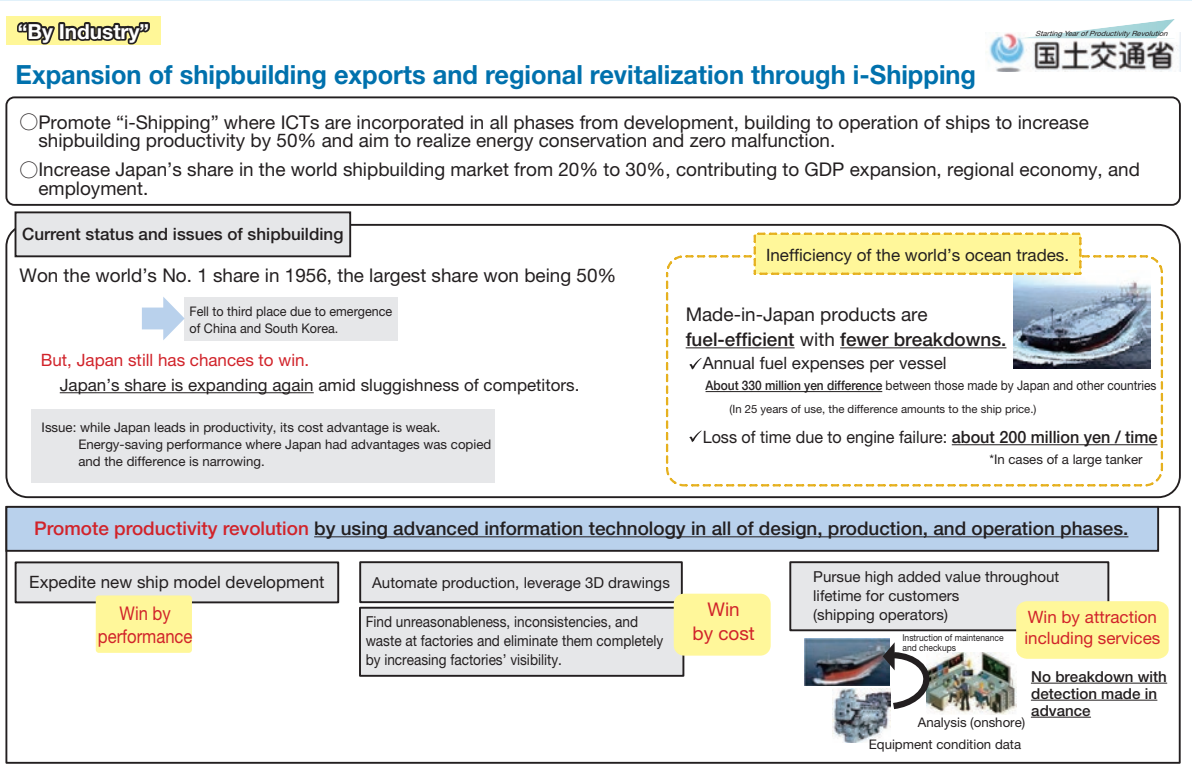
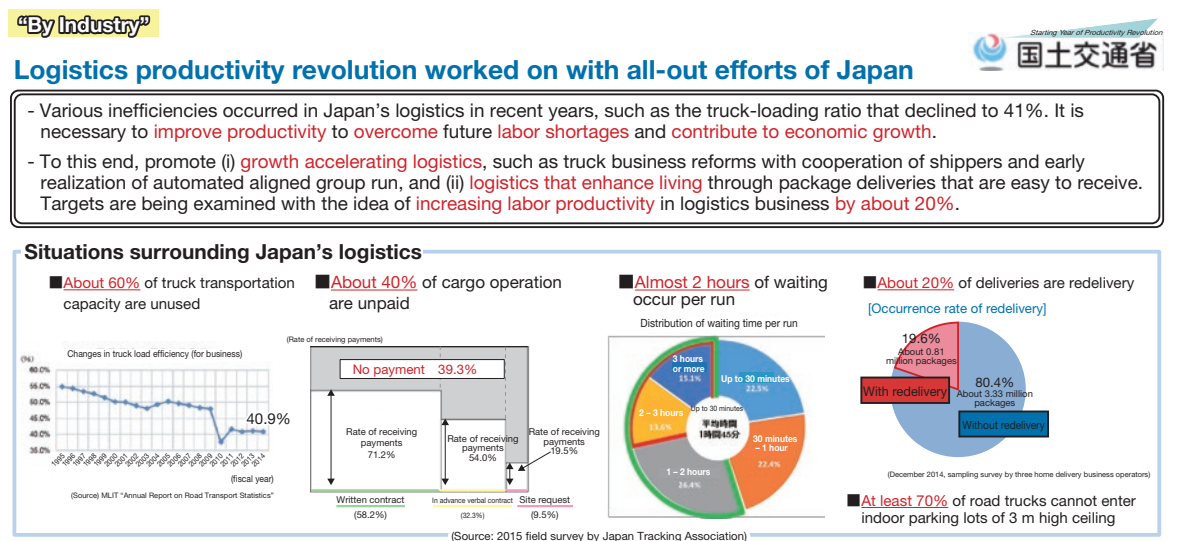


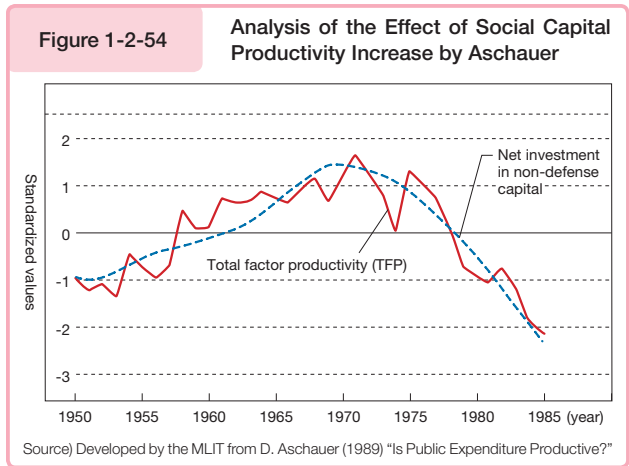
Figure 1-2-53 "By Industry" (iv) Logistics Industry



(Correlation between accumulation of social capital and TFP--Answer to the Productivity Puzzle--)

While it is very important to build up productivity increases at project levels, various researches are conducted also on the productivity boosting effect of social capital stock accumulated by public investment (productivity effect), from a macroeconomic perspectives. Research using Japan's data by prefecture has been conducted since the 1970s and such research progressed globally after the 1989 paper by Aschauer "Is Public Expenditure Productive?" ^{Note 34}. The U.S. at that time did not know the cause for slowing pace of TFP growth after the 1970s (so-called "productivity puzzle") ^{Note 35} and the research hoped to produce an answer to that.

The paper by Aschauer carries the stacked bar graph of changes in TFP and net assets of social capital (assets less capital consumption) in the United States after 1950 (Figure 1-2-54). Although we cannot immediately conclude that the growth in social capital stock led to increased TFP based on the research results, it should be noted as indicating the productivity effect of social capital.



(Productivity effect of social capital)

In Japan, there are multiple past researches on the productivity effect of social capital stock, and results of such research often show that development of social capital creates positive contributions (Figure 1-2-55).

Figure 1-2-55 Research Example of Productivity Effect of Social Capital in Japan

Researcher	Estimation period	Productivity Effect of Social Capital (value of elasticity)	Researcher	Estimation period	Productivity Effect of Social Capital (value of elasticity)
Iwamoto (1990)	1955-1984	0.238-0.408	Asako, Sakamoto (1993)	1975-1985	0.159
	1955-1970	0.055-0.416		1976-1985	0.065-0.144
	1971-1984	0.314-0.396		1976-1984	0.116
Takenaka, Ishikawa (1991)	1955-1985	0.2		1977-1985	0.055
				1977-1984	0.177
Mitsui, Inoue (1995)	1956-1989	0.248-0.316	Okui (1995)	1965-1980	0.072-0.243
Hatano (1998)	1955-1995	0.296-0.328	Doi (1998)	1966-1993	-0.082
	1955-1989	0.317-0.324		1975-1993	0.015
	1955-1984	0.316-0.318		1985-1993	0.254
1966-1974	0.131				
Yoshino, Nakajima, Nakahigashi (1999)	1955-1970	0.203	1975-1984	0.029	
	1971-1993	0.079	Shioji (2005)	1980-1995	-0.37-0.122
	1955-1993	0.4623			
	1955-1970	0.6487-0.8168 (Marginal productivity)			
1971-1993	0.0842-0.2246 (Marginal productivity)				
Mitsui, Takezawa, Kawauchi (1995)	1966-1984	0.142-0.214			
Okui (1995)	1965	0.053-0.055			
	1970	-0.116-0.018			
	1975	-0.13-0.034			
	1980	-0.049--0.259			

Source) Developed by the MLIT from Li, Hongmei (2010) "Literature study on productivity effect of public capital in Japan"

Note 34 Aschauer, D.A. (1989) "Is Public Expenditure Productive?" *Journal of Economics*, vol. 23, pp. 177-200.

Note 35 As for the cause of the decreased rate of TFP growth since 1970s in the U.S., (i) surging energy prices, (ii) entering into the labor market by baby boomers in large numbers with undeveloped skills, and various other factors are pointed out, but none of them was conclusive.

Chapter 2

Strategic Infrastructure Management That Brings About a Revolution in Productivity.

Chapter 2: Strategic Infrastructure Management That Brings about a Revolution in Productivity discusses the relationship between infrastructure development and the activities by private sector firms more specifically by presenting the efforts aimed at improving productivity and maximizing stock effects, as well as through a survey of the awareness of private businesses toward infrastructure.

First, in Section 1: Aiming at maximizing the Stock Effect, we will focus on cases in which stock effect are apparent. It mainly introduces cases that affect economic activities of private companies and lead to productivity improvement, and the approaches for visualization taken to understand various stock effects generated by infrastructure, as well as the recent administrative measures of the Minister of Land for maximizing stock effects.

Next, in Section 2: Effective Development and Operation of Infrastructure Through Public-private Partnership, it introduces the creation of new demands in private sector through the utilization of PPP/PFI and the cases of effective infrastructure development and operation, as well as the useful cases of community development and the recent administrative measures of the Minister of Land.

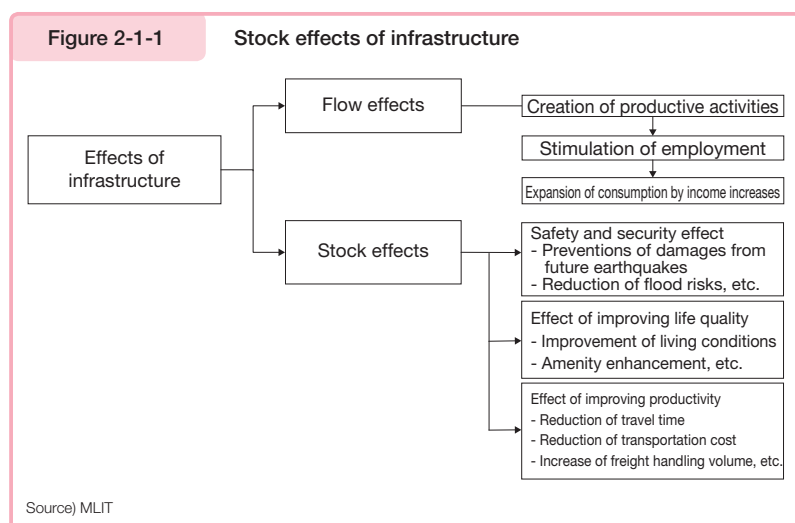
In addition, in the Section 3: The Results of Opinion Poll and Analysis of Private Businesses, in order to examine the direction of infrastructure development from the perspective of private businesses, we conducted an awareness survey (questionnaires) targeting private businesses, who are the users of infrastructure. The aim was to clarify the involvement of corporate activities related to policy issues and infrastructure such as the improvement of productivity in tertiary industry, disaster preparedness, response to an aging population society and innovation activities, as well as what is needed for both infrastructure development and users to maximize stock effects such as productivity improvement.

Section 1 Aiming at Maximizing the Stock Effect

1 Examples of the realized stock effect

As described in Section 2, Chapter 1, infrastructure investment has two types of effects: the flow effect and the stock effect. The flow effect is a short-term effect that expands the aggregate economy by the public work itself, which derivatively creates production, employment, consumption and other economic activities. The stock effect, on the other hand, is realized in the medium-to-long term when the infrastructure is accumulated and functions as social capital. The stock effect includes “safety and security effect” such as prevention of damages from future earthquakes, and reduction of flood risks;

“effect of improving life quality” such as improvement of living conditions, amenity enhancement; and “effect of improving productivity” such as reduction of travel time which leads to enhancing the base of society (Figure 2-1-1).



Infrastructure investment leads to development of the regional economy and improvement of the living environment. In addition, the effective use of developed infrastructure can bring about a greater impact. The Priority Plan for Infrastructure Development (Cabinet decision in September 2015) classifies infrastructure into three categories according to its main purpose and function, including growth infrastructure, safe and secure infrastructure and life infrastructure. This section introduces examples in which infrastructure mainly affects economic activities of firms and contributes to the improvement of their productivity.

(1) Growth infrastructure

■ Kita-Kanto Expressway

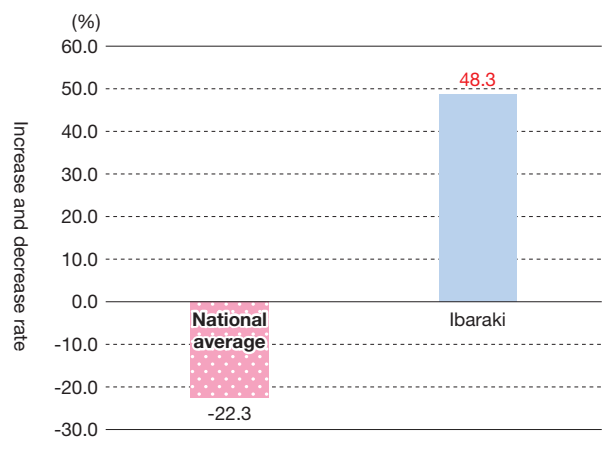
The Kita-Kanto Expressway runs from Takasaki City, Gunma, and the southern Tochigi to Hitachinaka City, Ibaraki. This National High-Grade Trunk Highways extends the entire length of 150 km and was completed in March 2011. In addition to the North-South axis toward Tokyo, this formed the East-West axis connecting Gunma, Tochigi and Ibaraki. From 2008 prior to the completion to 2013 after the completion, the volume of logistic transactions from Tochigi to Ibaraki increased by 48.3%, giving boost to the interaction of east and west (Figure 2-1-2).

In addition, there is a rapid development of industrial parks, corporations, and logistic warehouses mainly in the vicinity of IC. In 2014, Ibaraki ranked top for the number of establishment of new business facilities, followed by Gunma and Tochigi. As for the cumulative total value for the number of establishment, the growth is nearly double of national average (Figure 2-1-3). In terms of the area of establishment, Tochigi ranked top, followed by Ibaraki while Gunma ranked 7th, indicating that three prefectures top the list.

Such an activation of economic activities in the northern Kanto region has a major effect on the Metropolitan Inter-City Expressway (Ken-O Expressway), which the development has been in progress. The expressway bus connecting Utsunomiya City, Tochigi and Narita International Airport changed its route to pass through the Ken-O Expressway and the Kita-Kanto Expressway, leading to the shortening of time by about 30 minutes and lower fares (about ¥200). In addition, in Nikko, a

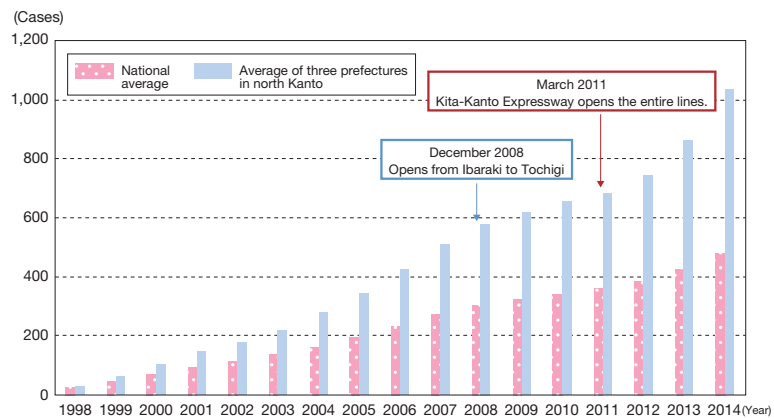
tourist attraction in Tochigi, the completion of the Ken-O Expressway has an instant effect and started seeing an increased number of tourists from wide areas including Shonan and Shizuoka during the season of fall foliage in 2015.

Figure 2-1-2 Changes of freight transportation volume from Tochigi (FY 2008 to FY 2013)



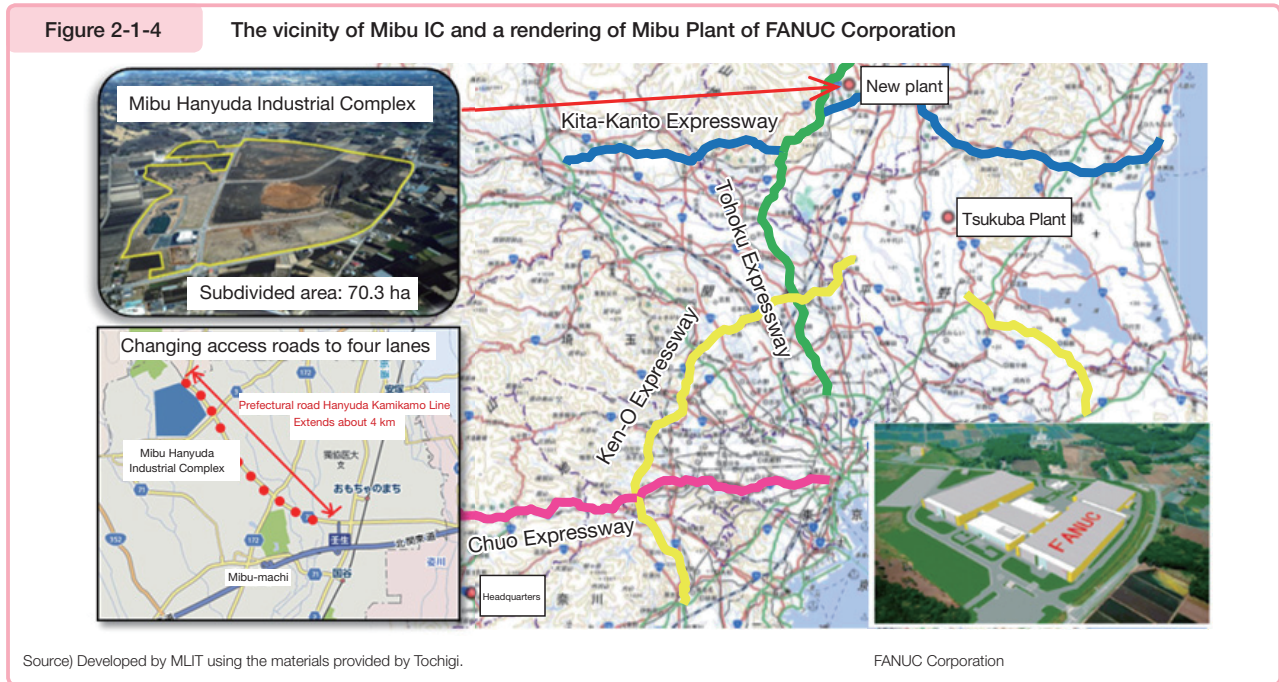
Source) Developed using the Freight Area Flow Statistics by MLIT

Figure 2-1-3 Changes in the number of business location in three prefectures in north Kanto and the nation.

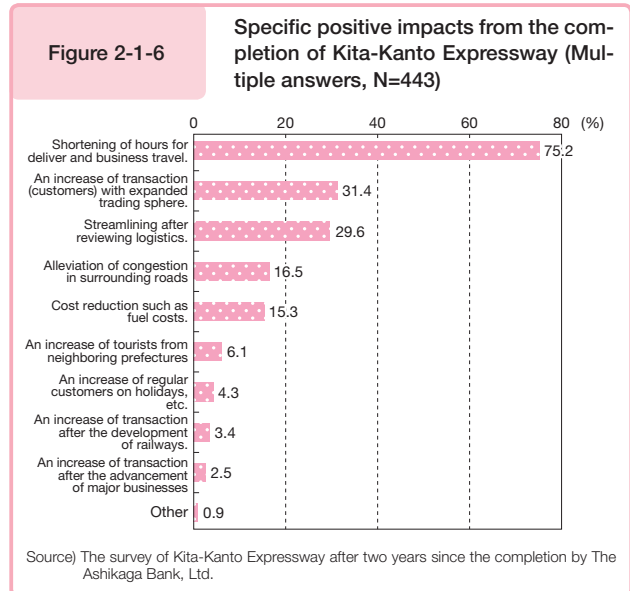
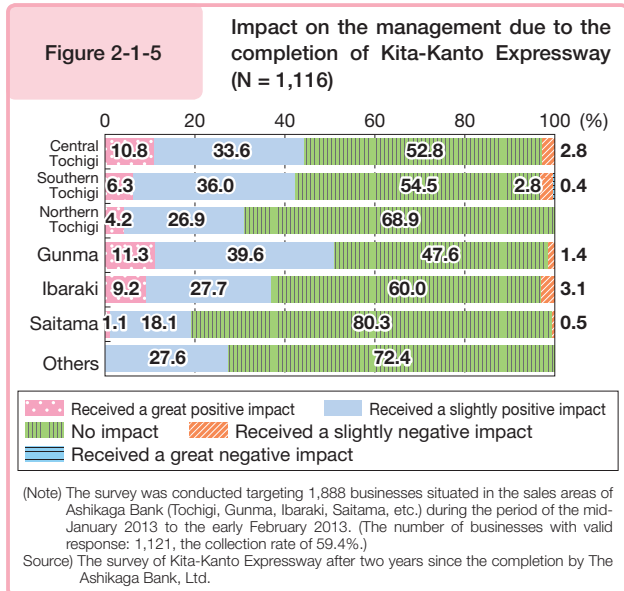


(Note) The number of locations is the average of three prefectures in north Kanto, including Gunma, Tochigi, and Ibaraki and the cumulative total of national average after 1998
 Source) Developed by MLIT from the Survey of Factory Location Trends (2014), Ministry of Economy, Trade and Industry.

In the vicinity of Mibu IC in Tochigi along the Kita-Kanto Expressway, FANUC Corporation, which has 50% of world shares in NC (numerical control) equipment machine tools, invested nearly ¥100 billion to build a new plant (to be opened in 2016). With the completion of Kita-Kanto Expressway and Ken-O Expressway, one of the reasons is to increase accessibility between the head office at the base of Mount Fuji, Yamanashi, and a plant located in Tsukuba City, Ibaraki. Even Tochigi has been working on developing four-lane roads in access roads to Mibu IC for the expansion of effect (Figure 2-1-4). A number of corporations building business establishments in Tochigi list the opening of the Kita-Kanto Expressway and Ken-O Expressway as a reason of expanding business, displaying a synergetic effect of developing the Kita-Kanto Expressway and Ken-O Expressway, as well as both infrastructures.



In addition, the local governments are not the only one who thought the opening of the Kita-Kanto Expressway as an opportunity for the activation of regional economy. The three banks including the Gunma Bank, Ltd. in Gunma, the Ashikaga Bank, Ltd. in Tochigi and the Joyo Bank, Ltd. in Ibaraki teamed up and held a business negotiation meeting for foods and exhibition of food and agriculture, titled Agri-Food Festival 2015 in Utsunomiya, with the aim of promoting interexchange among corporations that is centered on east and west. The survey conducted by The Ashikaga Bank, Ltd. revealed that many corporations actually feel economic effects from the completion such as shortened time and enlarged commercial sphere in local companies (Figure 2-1-5 and Figure 2-1-6).



■ Hokkaido Shinkansen

On March 26, 2016, the Hokkaido Shinkansen opened from Shin-Aomori and Shin-Hakodate Hokuto to allow traveling from Tokyo to Hakodate in nearly four hours. According to the Development Bank of Japan Inc., the economic effects of opening are calculated to be nearly ¥13.6 billion annually (published in October 2014), and the direct effects and ripple effects in tourism and business can be expected. In addition, the Seikan Tunnel (the common use started in March 1988) connecting Hokkaido and Aomori was designed with the standards in which new Shinkansen Line will run through in the future. With the completion of Hokkaido Shinkansen, this streamlining impact will be fully exerted.

For the opening, the development of secondary transit system advanced mainly in Hakodate and Sapporo. In order to facilitate traveling from Shin Hakodate Hokuto Station, which is a new station, to the center of tourism, Hakodate Station (local line), a shuttle service connecting both stations, called the Hakodate Liner, was developed to serve all express trains in Hakodate Hokuto Station traveling to Sapporo. In addition, the South Hokkaido Isaribi Railway (Goryokaku to Kikonai) will be opened to serve tourist trains (Figure 2-1-8).

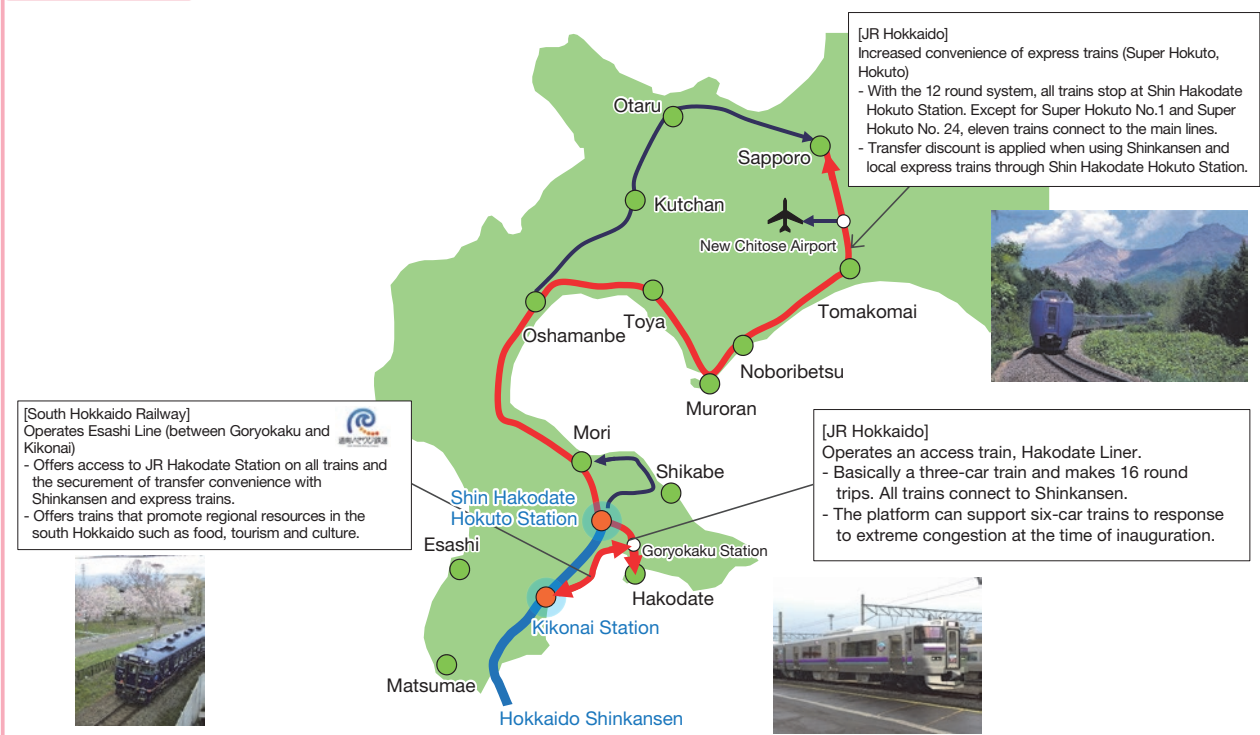
Figure 2-1-7

Hokkaido Shinkansen goes through the Seikan Tunnel.



Source) Japan Railway Construction, Transport and Technology Agency

Figure 2-1-8 The railway networks for the opening of Hokkaido Shinkansen.



Source) Hokkaido

As for the development of access roads connecting within Hakodate and the surrounding areas, as well as Sapporo, the landscape improvement along the train lines and the development of Michi-no-Eki (Roadside Station) provide the environment in which travelers can make a tour easily. According to the secondary transit population survey after the opening of Hokkaido Shinkansen (September 2014) implemented by the council of the Hokkaido Shinkansen Opening Strategic Promotion consisting of Hokkaido and financial circles, the results revealed that more than 50% of travelers from outside the prefecture use rental cars and buses for traveling, pushing forward the development of traffic line for users.

Also, in Aomori, Okutsugaru-Imabetsu Station was developed as the northernmost station in mainland Japan for Shinkansen. The adjacent Michi-no-Eki (Roadside Station) was also expanded and renovated as a transit base for users and re-opened for renovation in April 2015. This allowed the number of users to bump up from 20,000 users per year before renovation to 80,000 users in about six months after renovation.

Besides the improvement of structural aspects, there is also an active effort of promoting exchange between Hokkaido and Tohoku. Each travel company utilizes the benefits of railway that allow getting off on the way to plan new tours around Hokkaido and Tohoku with the use of Hokkaido Shinkansen. In addition, with the cooperation of the local Chamber of Commerce and Industry and financial institutions, the exchange among corporations has been advancing mainly in the tourism and food industry. North Pacific Bank Ltd. in Hokkaido and The Aomori Bank, Ltd. in Aomori established the Seikan Activation Fund as the public-private partnership fund for providing growth capital for corporations in Seikan area and offering management support in May 2014 for the development of new products using food ingredients from Hokkaido and Aomori (Figure 2-1-9).

For the inauguration of Hokkaido Shinkansen, it is expected to bring in economic effects in the tourism industry and the public-private partnership unites to brush up the regional attraction and to promote information dispatch in and out of Japan. In addition, by forming a large exchange sphere of Hokkaido and Tohoku, it is important to lead to the activation of economic activities and the improvement of regional attraction. The extension of Sapporo aims to be completed and opened by the end of 2030 ^{Note 36}. The effect of opening Shinkansen is expected to be maximized, giving a ripple effect throughout Hokkaido.

Figure 2-1-9

Hakodate Rolls, a Seikan joint plan product



Source) Hokkaido

Note 36 According to the Handling of New Shinkansen Lines (January 14, 2015. Agreement of the government and party), the completion and opening of line between Shin-Hakodate Hokuto and Sapporo will be moved up five years from FY 2035 to aim for the completion and opening by the end of FY 2030.

Column

Collaboration between governments and regional financial institutions to manifest stock effects. ~ Hokkaido Regional Development Bureau and North Pacific Bank, Ltd. ~

The Hokkaido Regional Development Bureau and North Pacific Bank, Ltd., concluded an agreement for cooperation in November 2014. The purpose is to encourage reviving tourism and regional promotion in Hokkaido by making use of the strengths of the government and the regional financial institutions. The collaboration includes measures to expand stock effects of the infrastructure and deepen the regional understanding on the infrastructure, so it may be said that the regional financial institutions are the partners of government to manifest new stock effects. The key approaches are introduced here.

(i) Seminar to add to the attractiveness of Michi-no-Eki (roadside station)

In order to solve the issues of regional revitalization, this seminar is a measure to support local governments that are trying to revitalize their roadside stations through collaboration with National Research and Development Agencies, the Public Works Research Institute and the Civil Engineering Research Institute for Cold Regions. In the first seminar held in August 2015, issues related to roadside stations were discussed among private businesses, local governments, and relevant authorities that are invited by North Pacific Bank. At the same time, efforts are being made to introduce private businesses that are cooperating in reinvigorating roadside stations to local governments (Figure 2-1-10).

Figure 2-1-10 A photo taken during the seminar for increasing the appeal of Michi-no-Eki (Roadside Station)



Source) National Research and Development Agencies, the Public Works Research Institute, the Civil Engineering Research Institute for Cold Regions

(ii) PPP/PFI Seminar in Asahikawa

In March 2015, under the auspices of the Asahikawa Development and Construction Department of the Hokkaido Regional Development Bureau, North Pacific Bank, Ltd., and the Asahikawa Chamber of Commerce & Industry, the PPP/PFI seminar to promote PPP/PFI projects based on proposals by the private sector was held. In the seminar, following the introduction of business and stories of personal experiences by representative companies now operating PFI projects, discussions were conducted about the PPP/PFI projects, the system of proposals by the private sector from the viewpoints of private companies, and the feasibility of the projects within the jurisdiction.

(iii) Panel exhibition of stock effects of the infrastructure

In order to let a wide range of local residents know the impact of streamlining of the infrastructure, a panel exhibition is now underway using the head and branch offices of North Pacific Bank.

■ Higashi-kyushu Expressway, Nakatsu Port and Hososhima Port

Higashi-kyushu Expressway is a 436 km arterial high-standard highway, which starts from Kitakyushu-shi, Fukuoka, passes through each prefecture of Fukuoka, Oita, Miyazaki and Kagoshima, and reaches Kagoshima City, Kagoshima. Except for some sections, it is placed in service to connect seas along the highway, air traffic bases and cities of commerce and industry such as Kitakyushu City and Oita-shi to form a Kyushu's integral network along with Kyushu Jukan Expressway and Kyushu Odan Expressway.

• Nakatsu Port in Oita

In the northern part of Kyushu, the automotive industry is becoming more a key industry. The Nakatsu Port in Oita plays a central part to push forward the development of ports, harbors, and access roads. In 1999, since the Nakatsu Port was appointed as a key port and harbor, the area was developed as a logistic base by improving piers and it has been placed in service since 2004. At that same time, the Nakatsu-Hita Road connecting the Nakatsu Port and Higashi-kyushu Expressway was also built (Figure 2-1-11).

With the improvement of transportation infrastructure centering the ports, Daihatsu Motor Kyushu Co., Ltd. built a plant in Nakatsu Port. In 2004, the company moved its headquarters and began production. This also attracted the accumulation of automobile related industries, and from 2003 to 2014, the cargo volume of Nakatsu Port grew by nearly eightfold and the number of households in former Nakatsu City increased by about 1.2-fold, bringing major economic effects to the area (Figure 2-1-12). In addition, surrounding cities of Oita and Nakatsu Port are putting effort into the improvement of living environment such as support for human resources development and child care in order to facilitate the supply of human resources to the accumulative businesses and the promotion of settlement.

In March 2015, the Higashi-kyushu Expressway (Buzen IC to Usa IC) to directly connect the Nakatsu-Hita Road (Nakatsu Port to Higashi-kyushu Expressway), which creates an additional expectation to the development as a base of the automotive industry in Kyushu in the days to come.

• Hososhima Port, Miyazaki and major ports

There are enormous amount of forest resources in the mountains in Kyushu. Because of the recent increase of timber demands in East Asia and the correction of the tendency of rising yen, the lumber prices are on the rise to stimulate the start of new timber export businesses. Because of this situation, Hososhima Port and other ports and harbors in Kyushu see a steep increase of timber export to countries in East Asia, leading to the restoration of the forestry industry, maintenance, and creation of regional employment.

In the Hososhima Port, Miyazaki, a Japanese major lumber corporation, Chugoku Mokuzai Co., Ltd. made a foray to

Figure 2-1-11 Near Nakatsu IC/Nakatsu Port

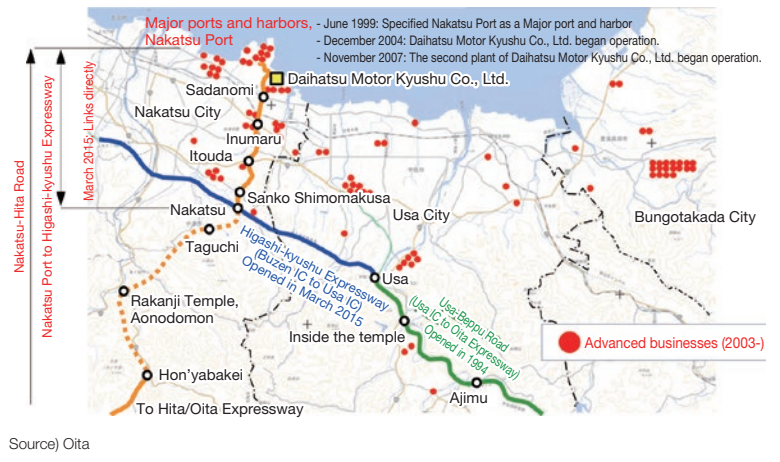


Figure 2-1-12 The Cargo Volume at Nakatsu Port and the number of households of former Nakatsu-shi

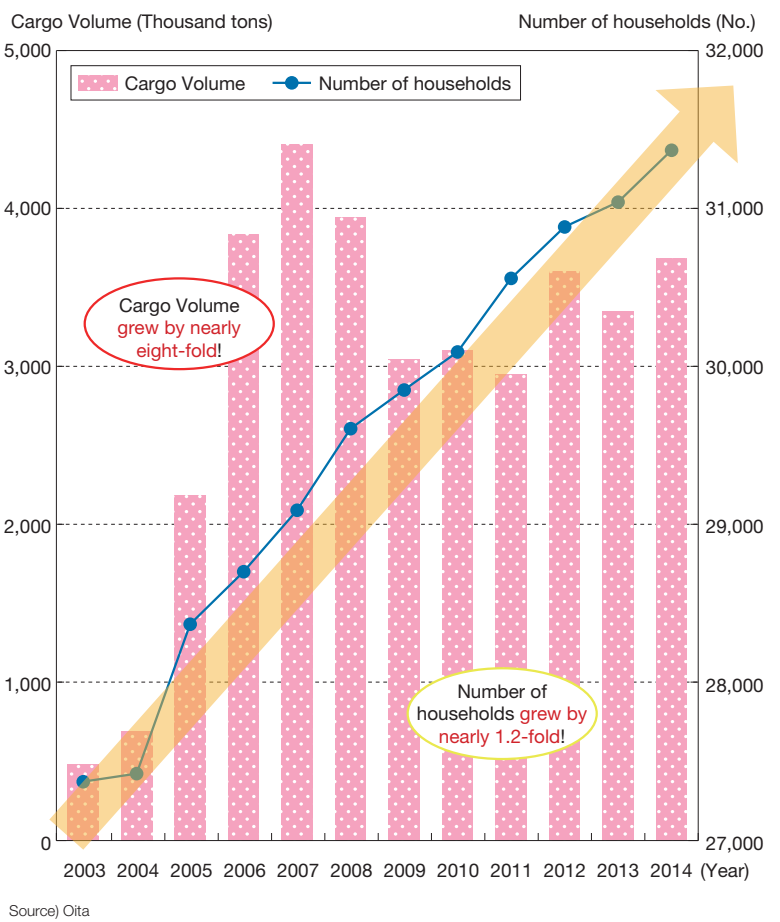
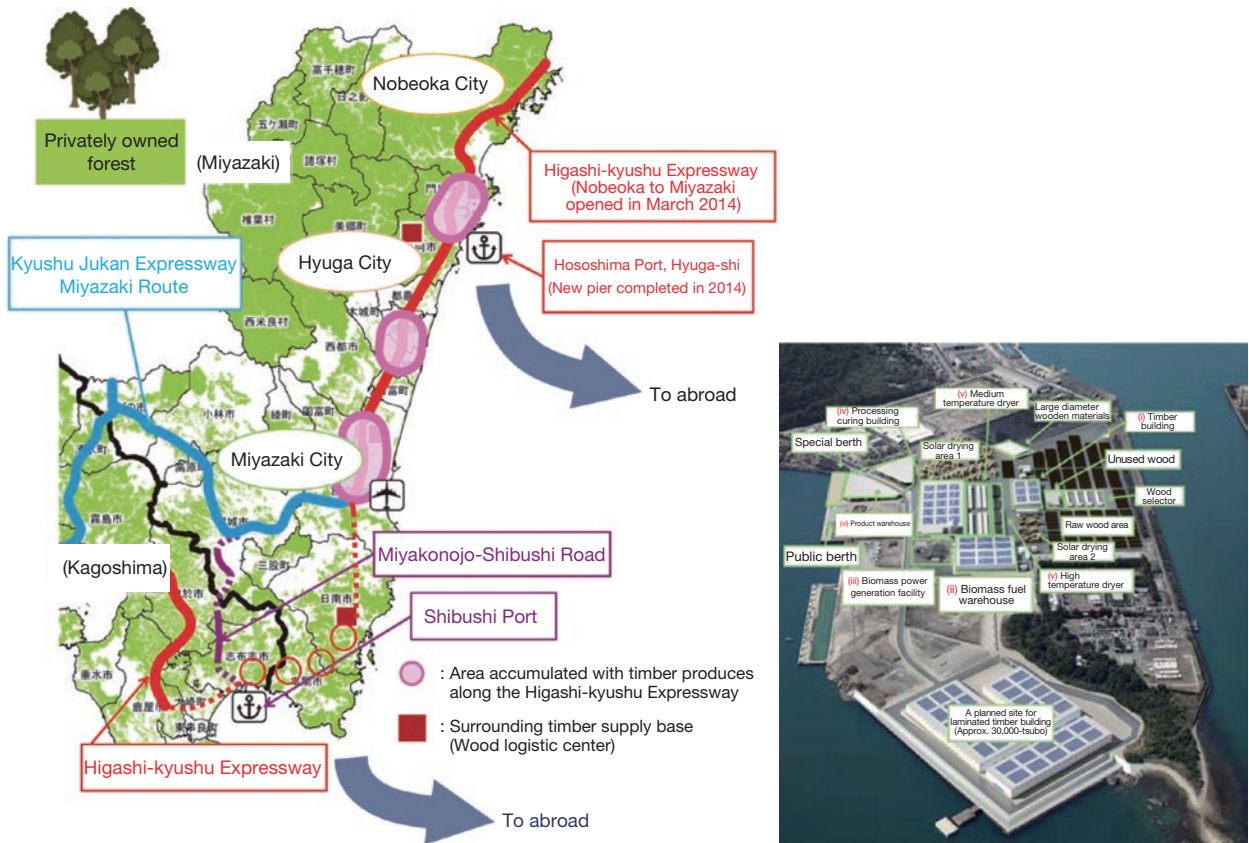


Figure 2-1-13 Major infrastructures in the timber industry in Miyazaki and Hyuga Plant, Chugoku Mokuzai Co., Ltd.



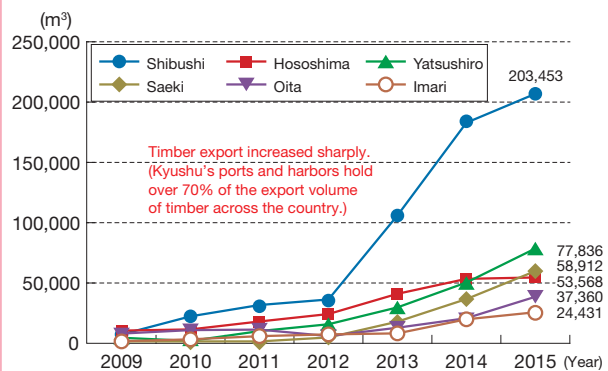
Source) MLIT

Source) The website of Chugoku Mokuzai Co., Ltd.

expand the business in December 2014 and began shipping lumber across the country. Behind this background, the construction of plants in the Hososhima Port, which is adjacent to a timber supply area, brought down the cost of logistics and enabled the securement of a plant site within the port. Other reasons behind were that the port will enable exporting products in future and the development of expressways such as Higashikyushu Expressway advanced to create a preferred environment for corporations to expand their business.

Chugoku Mokuzai Co., Ltd., utilizes timber from Miyazaki to employ a comprehensive operation of lumber, processing and biomass power generation. The total capital investment is expected to be ¥40 billion and the number of new employees will be 300. Including the forestry businesses in the related industries, the company has been making a significant contribution to the regional employment (Figure 2-1-13 and 2-1-14).

Figure 2-1-14 Changes of timber export in major ports in Kyushu.



Source) Developed by MLIT from the Trade Statistics by the Ministry of Finance.

- Wide-area cooperation in Kyushu and Shikoku

As for the tourism, the development of Higashi-kyushu Expressway activated the exchange between Kyushu and Shikoku. Travel agencies added plans to tour around Ehime from Miyazaki and Kagoshima. West Nippon Expressway Company Limited is planning on adding a free pass plan of expressways in Oita and Miyazaki for ferry users (Figure 2-1-15).

Figure 2-1-15 The driving paths of West Nippon Expressway Company Limited



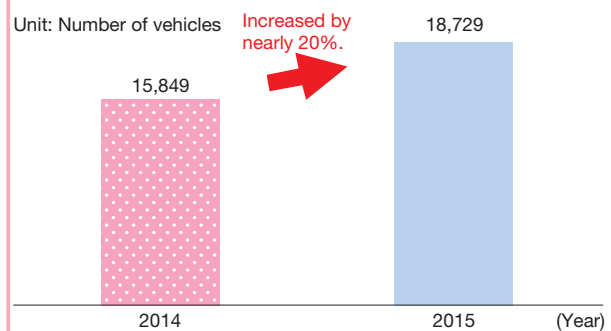
Source) West Nippon Expressway Company Limited

With these efforts, the number of vehicles that used ferry between Ehime and Oita during the Golden Week in 2015 increased by about 20% from the previous year (Figure 2-1-16). In the Yawatahama Port in Ehime, which serves as an entrance on the Shikoku side, a Michi-no-Eki (Roadside Station), Minato Oasis “Yawatahama Minatto”, opened in April 2013, attracting a host of users. In addition, the development of Ozu-Yawatahama Expressway, which is the access roads from Yawatahama Port to Shikoku and the strengthening of functions of Shikoku Jukan Expressway to reach Kyoto, Osaka, and Kobe, will also form a broad route that connects Kyushu, Shikoku, Kyoto, Osaka, and Kobe to stimulate the tourism and logistics industries in the future.

As described above, the development of Higashi-kyushu Expressway increased the location superiority of Kyushu, which is close to countries in Asia, and contributes to the economic vitalization in the Kyushu region and the enhancement of international competitiveness for domestic corporations. What is more, the development of traffic network across the country from Kyushu to Shikoku and Kansai to Kanto is expected to facilitate the exchange of tourism and logistics in broad areas.

Figure 2-1-16

The number of vehicles on three ferry routes from Ehime to Oita during a major holiday.

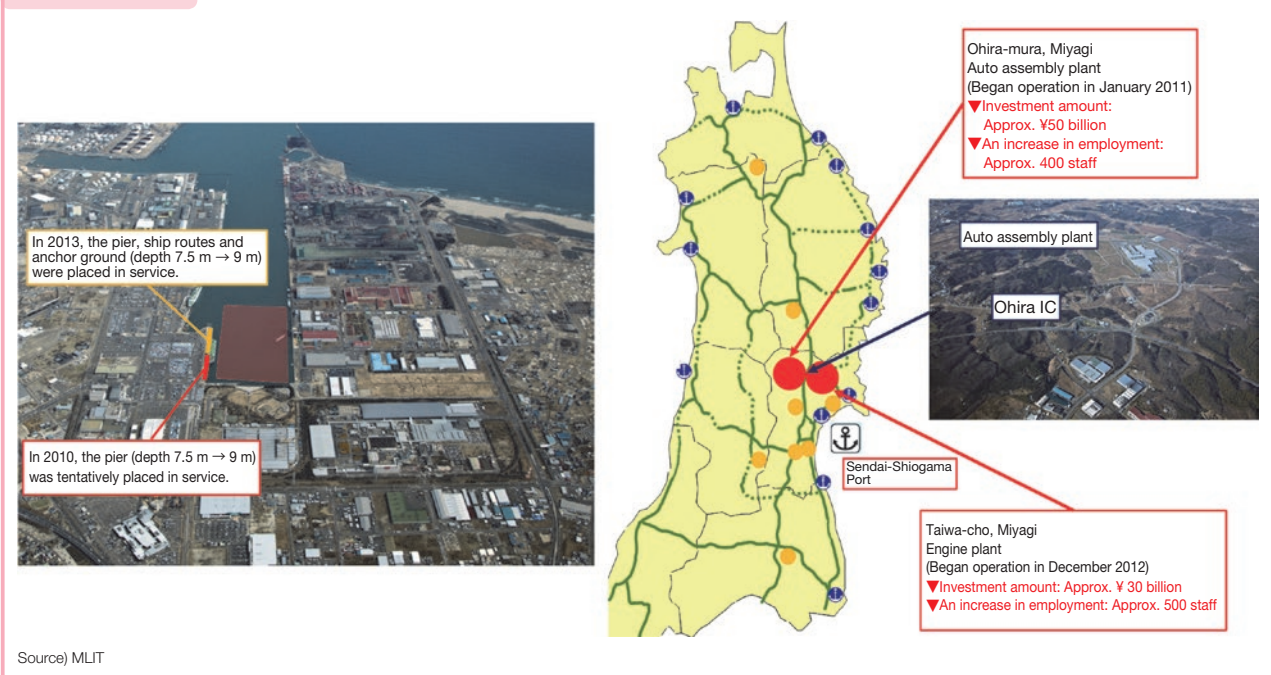


(Note) The survey period was for eight days from April 29 to May 6 in 2014 and 2015.
Source) The interview survey results of each sea route operator by MLIT

■ Sendai-Shiogama Port and Ohira IC

The Tohoku Expressway runs through the vicinity of Ohira-mura in Miyagi to provide a home-court advantage of 30 km to the Sendai-Shiogama Port, which is the largest in the Tohoku region. Also, the placement of Ohira IC by Miyagi increased traffic convenience and attracted the investment of corporations in the area mainly by automobile manufacturers. Central Motor Co., Ltd., (current Toyota Motor East Japan, Inc.) decided to build a domestic production base of small vehicles in the area ^{Note 37}. With that, the piers that can correspond to larger transport vessels were developed at the Sendai-Shiogama Port (water depth from 7.5 m to 9 m) to strengthen the handling capacity of vehicles and give a boost to efficient logistics (Figure 2-1-17).

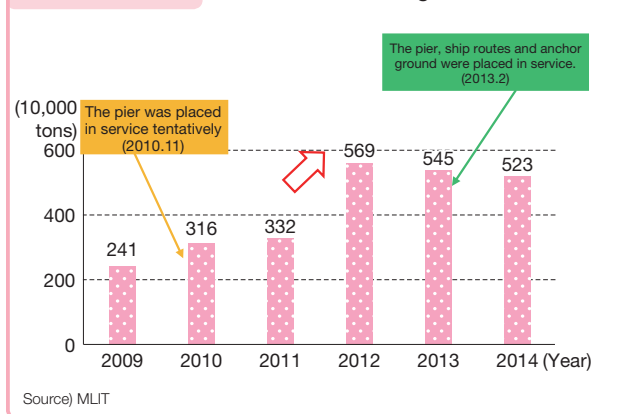
Figure 2-1-17 Sendai-Shiogama Port and the vicinity of Ohira IC



Through the impact of such infrastructure development, the production volume of vehicles in the area is on the rise. During the time of Great East Japan Earthquake occurred in March 2011, the early resumption of Sendai-Shiogama Port helped the recovery of production activities of corporations at an early date. In 2012, the handling volume of complete vehicles transport at the Sendai-Shiogama Port increased dramatically (Figure 2-1-18).

At present, the headquarters functions of Toyota Motor East Japan, Inc., moved to Ohira-mura and attracted related corporations. This brought a rise in employment and internal training facilities were built to serve as a major driving force of regional revitalization.

Figure 2-1-18 The handling volume of complete vehicles at Sendai-Shiogama Port.



Note 37 The IC is located in the center of plant that will be newly constructed in east and west of the Tohoku Expressway. Also, to adjust installation time, a waiting space for trucks was added to the adjacent of the IC.

■ Nihonkai Engan Tohoku Expressway and Keihin Port

Nihonkai Engan Tohoku Expressway is a 322 km-long National High-Grade Trunk Highway that connects Niigata, Yamagata, Akita, and Aomori. The contemplated route was announced in 1987 and the roads are opening in Niigata sequentially after 2002. In prospect of the advancement in road development, in 1990, a world leading manufacture of aircraft interior, JAMCO Corporation, began the operation of a new plant in Murakami, Niigata (Niigata JAMCO Corporation). Niigata JAMCO Corporation procures parts from Yamagata and Akita for assembly and transports to the Keihin Port to ship to aircraft manufactures overseas (Figure 2-1-19). The sequentially opening Nihonkai Engan Tohoku Expressway was utilized to expand the business. The JAMCO Group’s galleries (kitchen equipment) account for 30% of the share in the world and 70% of it are handled by Niigata JAMCO. Also, Niigata JAMCO handles the entire world share for the lavatories (bathroom equipment), which is 50%.

In keeping with the strong sales and anticipated demands, the company hired 250 new employees locally in 2013 and 2014, bringing the total of locally hired employees to 550 employees. In Murakami, the valid job opening-to-application ratio reached the level of about two-fold of the average in Niigata, indicating the company’s contribution in creating regional employment (Figure 2-1-20). In addition, in February 2016, the company began the operation of the second plant in Murakami.

At present, the development of the missing link from Asahi Mahoroba IC (Niigata) to Atsumi Onsen IC (Yamagata) (Asahi Atsumi Road) is in progress. The traffic convenience is expected to increase with the completion of these routes, which leads to the vitalization of the local districts (Figure 2-1-21).

What is more, the opening of Nihonkai Engan Tohoku Expressway is expected to improve the aspect of disaster preparedness. The national route 7, which is the major trunk road in Niigata and Yamagata, has been faced with the occurrence of mudslides due to heavy rainfalls, overtopping waves and motor accidents. The mudslide occurred in July 2006 caused a complete closure for 42 hours. The improvement of Nihonkai Engan Tohoku Expressway secures a substitute road network to avoid severed road networks (the securement of redundancy), bringing in safe and secured logistic transport and residents’ life.

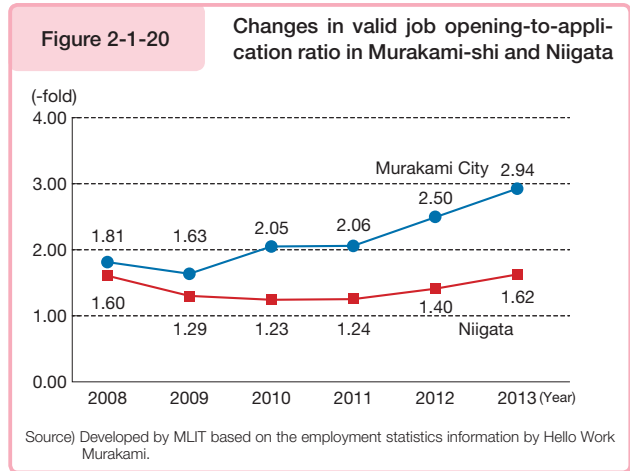
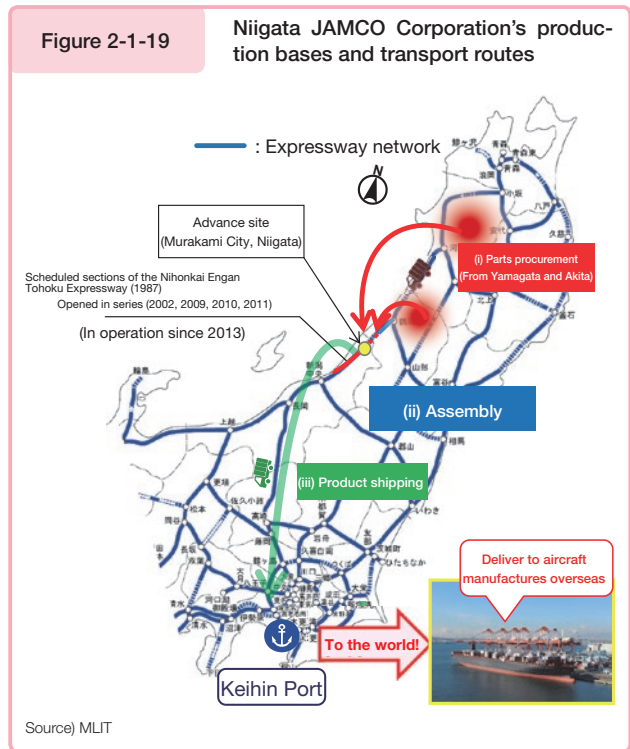
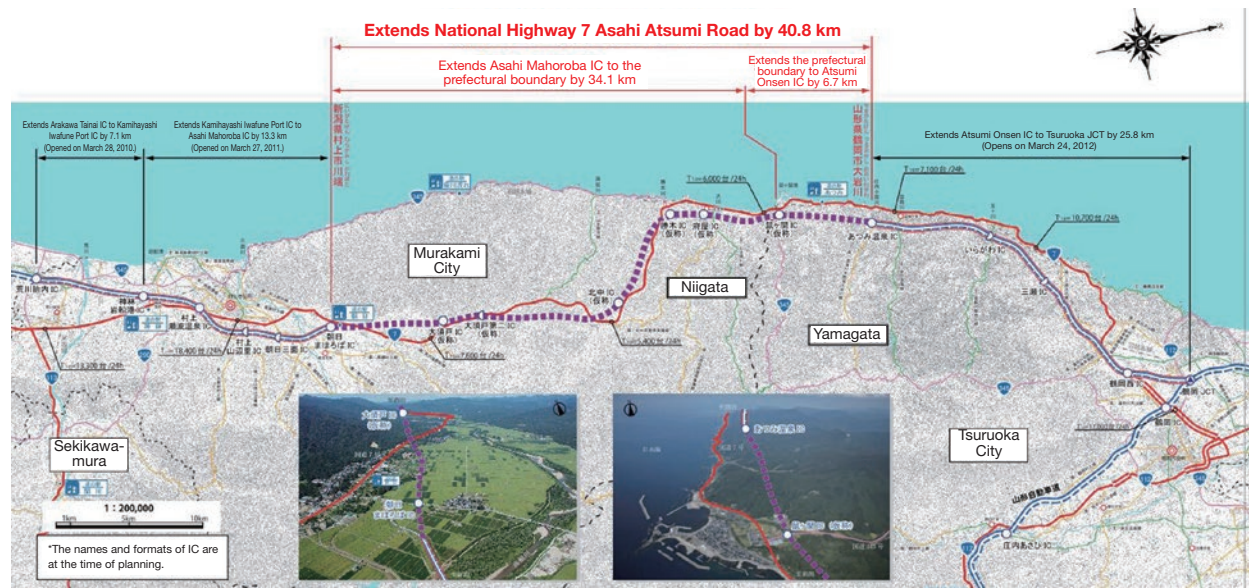


Figure 2-1-21 Asahi Atsumi Road that the development is in progress



Source) MLIT

■ Tokuyamakudamatsu Port

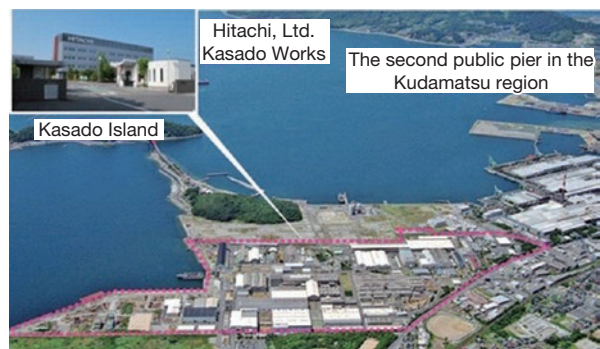
Tokuyamakudamatsu Port (Kudamatsu Second Public Pier) is located in the vicinity of Kasado Works, Hitachi, Ltd. (Figure 2-1-22). Prior to the development of Tokuyamakudamatsu Port, due to the restrictions of port and harbor facilities, large vessels were not able to come alongside the pier. Because of this, the port was not used for marine transportation of railway vehicles for the United Kingdom manufactured at the plant. The transport form at that time was to barge from the pier alongside the plant to Kobe Port and then transship to a large vessel to transport to the U.K.

For this, in order to allow berthing of large vessels in Tokuyamakudamatsu Port, the mooring posts and fenders were added to the port (Completed in July 2015) (Figure 2-1-23). This allowed the railway vehicles manufactured at the plant to transport to the Tokuyamakudamatsu Port (Kudamatsu Second Public Pier), which is about 4 km away, to load them to a large vessel (to load with other export articles) and travel through Nagoya and Yokohama Port to ship to the U.K. In addition, the asphaltic pavements were constructed at the pier to allow temporary storage of railway vehicles before shipment to improve convenience (Figure 2-1-24).

These improvements shortened the transport days to England by eight days from 53 days to 45 days. The transport costs are also expected to reduce by nearly 20%.

We can say that this is a great case that realizes stock effects with relatively small improvement costs by reflecting opinions from private businesses.

Figure 2-1-22 Tokuyamakudamatsu Port and Kasado Works



Source) MLIT

Figure 2-1-23

Improved mooring post (right)
(The left is the existing mooring post)



Source) MLIT

Figure 2-1-24

Paved pier sites



Source) MLIT

■ Ebina Junction of the Tomei Expressway

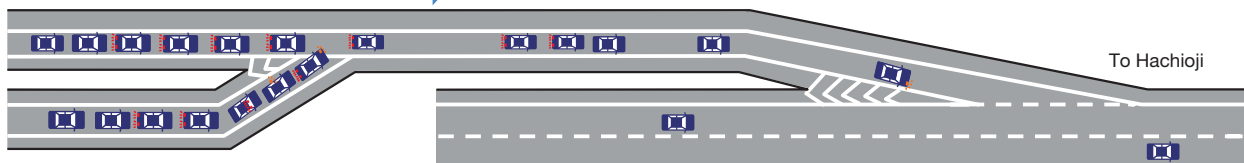
The lamps (external lamp) toward Tomei Expressway to the north of Ken-O Expressway often had backups at the merge points during rush hours in the morning and evening on weekdays, as well as early evenings on holidays. Central Nippon Expressway Company Limited aims to relieve backups to operate two-lane roads by tentatively narrowing down the existing lane width and shoulder width on roadway from October 30, 2015 (Figure 2-1-25).

Figure 2-1-25

The improvement outline of Ebina Junction, Tomei Expressway

■ Before

Tomei inbound ⇒ Ken-O Expressway (F lamp)



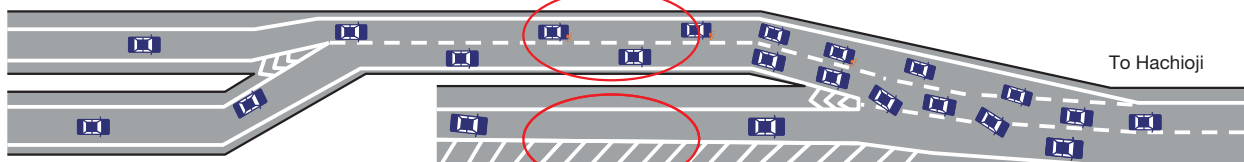
Tomei outbound ⇒ Ken-O Expressway (D lamp)

To Chigasaki

Ken-O Expressway Main Line (Outbound)

■ After

Tomei inbound ⇒ Ken-O Expressway (F lamp)



Tomei outbound ⇒ Ken-O Expressway (D lamp)

To Chigasaki

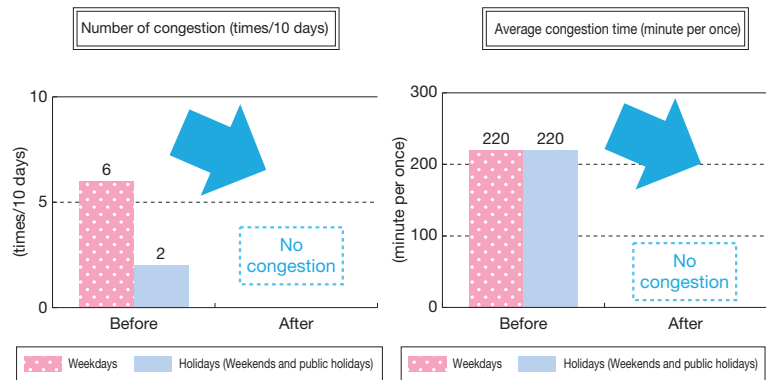
Ken-O Expressway Main Line (Outbound)

Lamp lane (partial): Two lanes to one lane

Source) Central Nippon Expressway Company Limited

The external lamps with such measures started seeing fewer backups (Figure 2-1-26) and with maintenance and improvement work by reducing costs, the effect of constructing traffic networks is maximized to lead to the definite tense of users and the securement of safety.

Figure 2-1-26 Changes in congestion before and after improvement



(Notes) 1 Before operation: From Friday, October 16 to Sunday, October 25, 2015. After operation: Saturday, October 31 to Monday, November 9, 2015.
 2 The traffic volume on outbound lamp was about 23,000 vehicles per day before operation and about 26,000 vehicles per day after operation.
 3 Congestion: The condition that cars that drive slow below 40 km per hour or repeat stop and go for more than one km or for more than 15 minutes.
 (Source) Central Nippon Expressway Company Limited

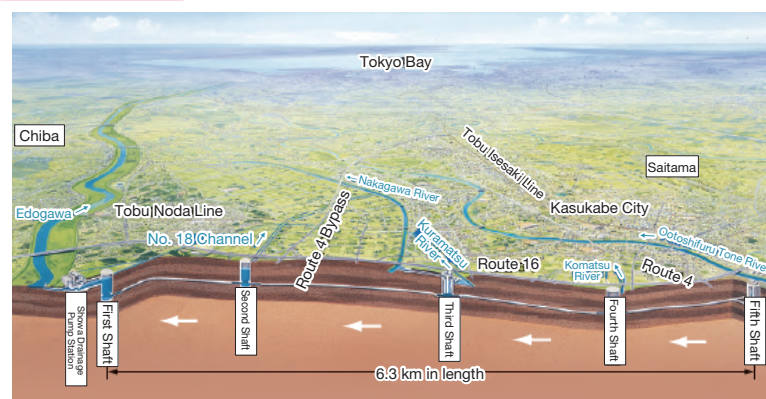
(2) Safe and secured infrastructure

Metropolitan Area Outer Underground Discharge Channel

Kasukabe City located in eastern Saitama has numerous rivers as the area is surrounded by Nakagawa River, Tone River, Edogawa River, and Arakawa River. The altitude is low and water tends to back up, creating an environment that easily causes floods after typhoon and heavy rainfalls in broad areas.

In order to resolve these issues, the Metropolitan Area Outer Underground Discharge Channel was built under the national route 16 crossing Kasukabe City from east to west. It was completed in 2006 (Figure 2-1-27).

Figure 2-1-27 Illustration of the Metropolitan Area Outer Underground Discharge Channel

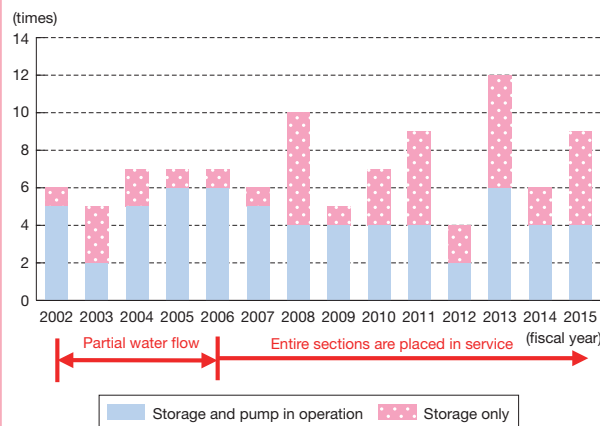


(Source) MLIT

This discharge channel takes water from swollen rivers and discharges into Edogawa River through the underground discharge channels. After partial water flow in 2002, the number of channels in operation reached an accumulated total of hundred times by FY 2014 and more than seven times in annual average (Figure 2-1-28). By placing in service, the occurrence of floods in the Nakagawa River and Ayase River basin including Kasukabe declined dramatically. While the number of units experienced flood damage in 1990 was approximately 35,000 houses for ten years, the number dropped to 5,745 houses in ten years from 2000.

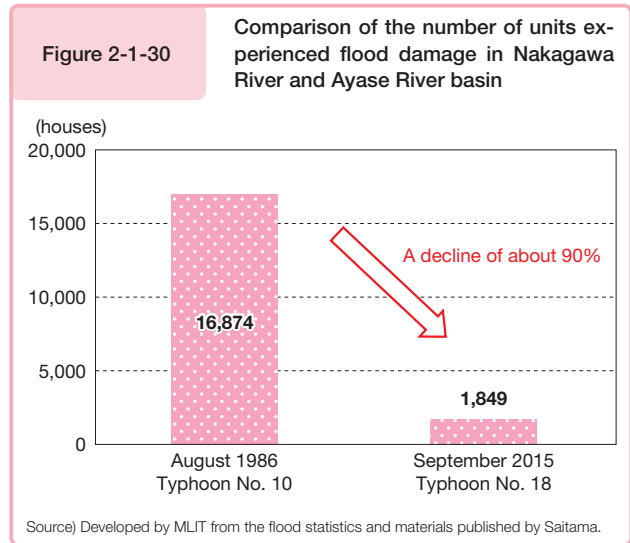
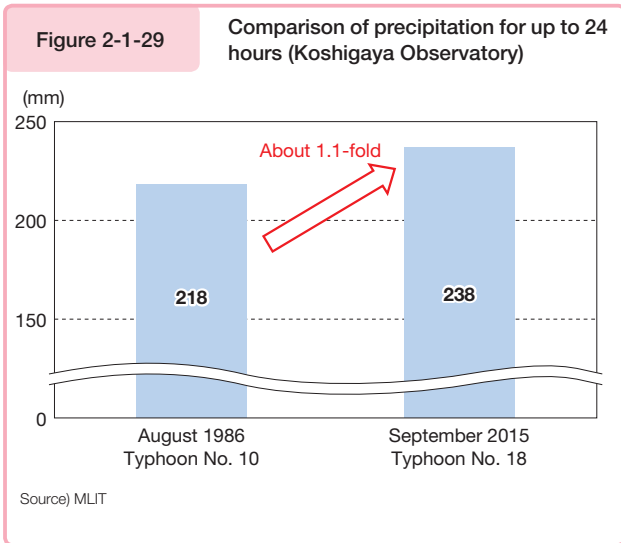
In addition, at the time of the Kanto and Tohoku Heavy Rainfall in September 2015, the water flow of discharge channels recorded the largest flow volume since the start of water flow. With this, compared to the flood in August 1986, while the rainfall was about 1.1-fold, the number of units experienced flood damage in the Nakagawa River and Ayase River basin declined from 16,874 houses to 1,849

Figure 2-1-28 Operation status of the Metropolitan Area Outer Underground Discharge Channel



(Source) MLIT

houses, which is a decline of nearly 90% (Figure 2-1-29 and 2-1-30).

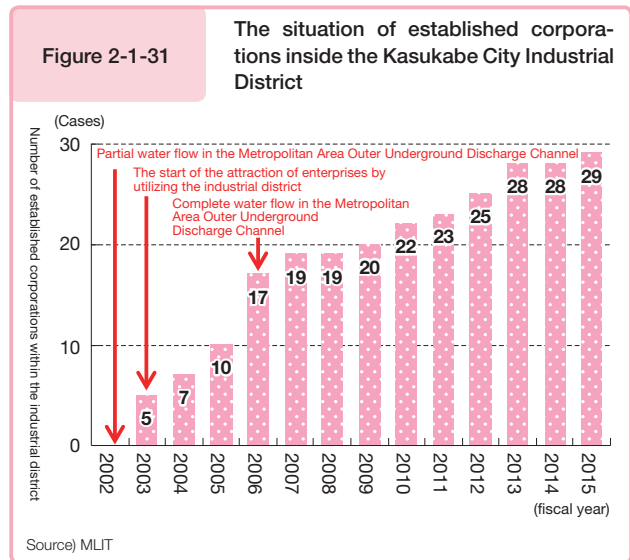


With the decline of flood risks, in 2003, Kasukabe City specified the vicinity of Showa IC as the industrial designated region in which the route 16 and the route 4 cross to promote the attraction of enterprises. Since Kasukabe is basically an area with great traffic convenience, twenty-nine corporations operating distribution warehouses and shopping centers made a foray to create the employment of over 3,000 people (Figure 2-1-31).

In addition, the appearance of surge tank received the name of underground Parthenon and attracts a host of visitors. It also gains popularity as a tourist destination and a location for shooting movies and TV shows. There are events that lead to regional promotion by the government, municipality, and citizen organizations (Figure 2-1-32).

With the development of structural aspects, Kasukabe is also putting efforts on the measures on non-structural aspects. Each year, for the preparation of floods and other disasters in the surrounding areas located on the right bank of Edogawa River and Edogawa River, the flood prevention frameworks and flood prevention constructions have been in place. Also, in December 2015, a disaster hazard map was created to include preparedness for earthquakes, floods and other disasters to raise the awareness of disaster prevention in the area.

As just described, the Metropolitan Area Outer Underground Discharge Channel are beneficial in displaying major effects on the reduction of water floods risk to make a contribution on the development of regional economy.



■ Mount Fuji sediment control facilities project

In Fujinomiya City and Fuji City situated at the southwest base of Mount Fuji, there are frequent sediment-related disasters due to sediment discharge from the collapse of Osawa ^{Note 38}, which makes it difficult for land use.

Starting in 1969, the direct sediment control facility project began and set up 77 facilities including the Osawa River sediment-retarding basins (Figure 2-1-33). With this, the sediment-related disasters caused by heavy rainfalls are prevented beforehand. When the debris flows of about 280,000 sq. meters, which is the largest one in recorded history, traveled down in 2000, the sediment control facilities trapped the sediments. The facilities also banked up the debris flows occurred in April 2015 and prevented any damages to surrounding areas.

With the decline of sediment-related disasters, the industrial parks were reclaimed to promote establishment of corporations. The number of corporations made a foray in the western base of Fujinomiya City and Mount Fuji is reaching 40 corporations at present since two corporations were established in 1986.

In addition, for tourism, the number of tourists, which was about 500,000 in 1989, has been growing continuously and reached over 2 million tourists in 2013, which is an increase of more than four-fold (Figure 2-1-34). Since the area originally has great views of Mount Fuji and surrounded with abundant nature, the progress of development leads to regional revitalization that utilizes tourist resources.

In addition, the Chubu Regional Development Bureau Fuji Sediment Control Facility Office teams up with local governments in Shizuoka to hold an observation meeting for the collapse of Osawa and participate in civil events to raise the awareness of disaster prevention among local residents and deepen the understanding of sediment-related disasters.

(3) Life infrastructure

■ Shinagawa Season Terrace

Shinagawa Season Terrace is a commercial building that mainly has offices and shops and opened in the Shinagawa area in May 2015. There are many facilities in the Shinagawa area, including Tokaido Shinkansen Shinagawa Station, an original station for Chuo Shinkansen for Linear Motor Cars, and the JR line new stations to be built in between Shinagawa and Tamachi, making it an area of major development in the future.

Shinagawa Season Terrace is a large eco-friendly complex building with enhanced disaster prevention functions (quake-resistant mechanism, emergency power generation, acceptance of people who are unable to return home after disasters, etc.) and numerous characteristics worthy of special mention. What it should be pointed out is the integrated development of upper space along with the update of sewerage facilities.

Note 38 It is a large erosion valley situated in the due west of Osawa River along Mount Fuji. The maximum width is 500 m and 150 m in depth. It reaches near a height of 2,200 m above sea level from the bottom of crater on the mountaintop.

Figure 2-1-33

The peripheral map of Osawa Fan region

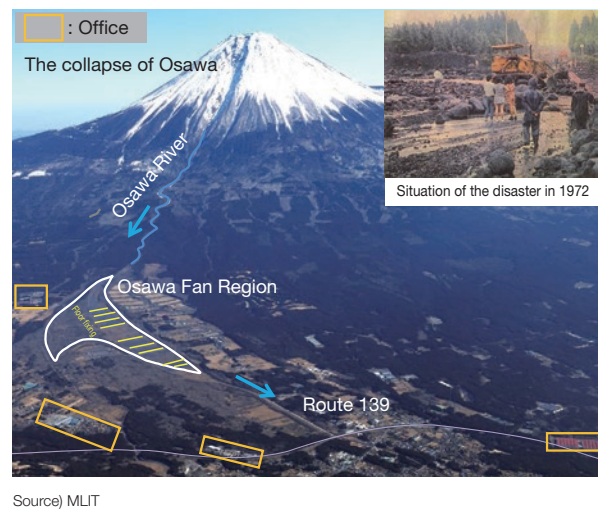
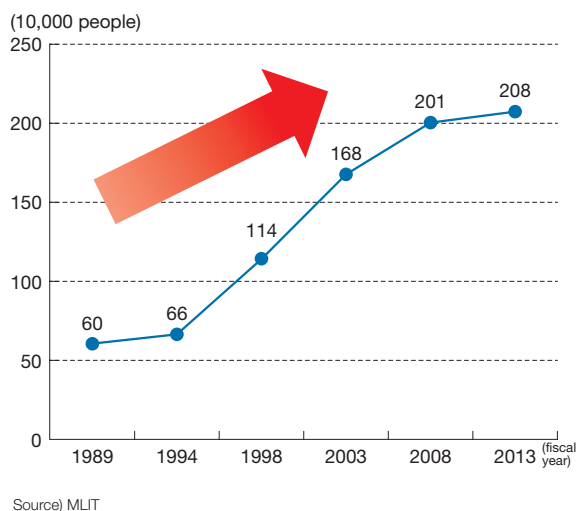


Figure 2-1-34

Changes in the tourists in the western base of Mount Fuji, Fujinomiya City

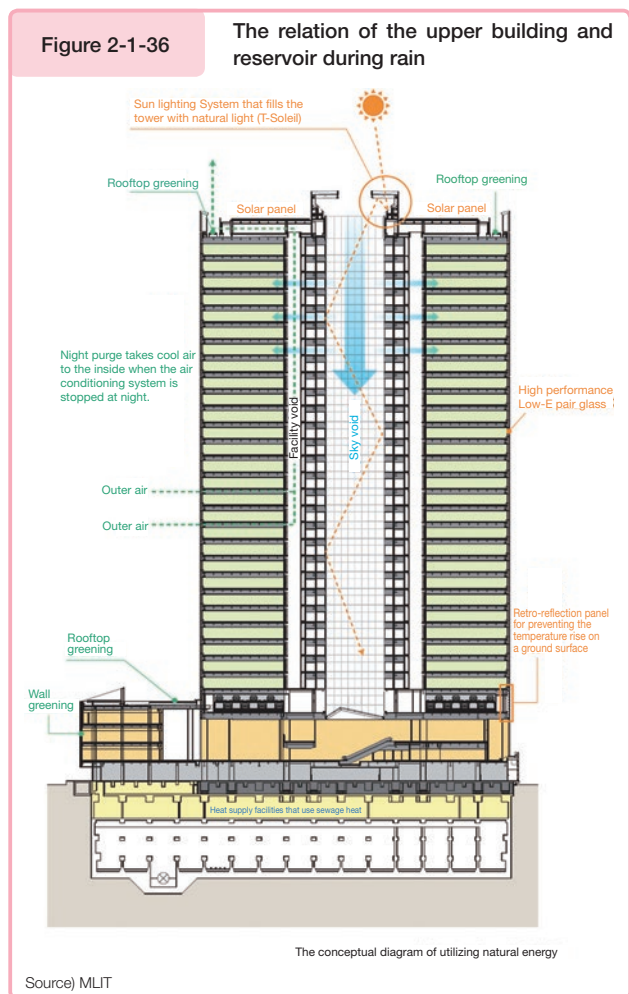


In general, within the premises of the city facilities such as roads, rivers, parks, and sewerage facilities under the City Planning Act, the construction of facilities is limited one cannot develop buildings with shops and restaurants. Although the original plan was to construct a reservoir for rain that collects soiled sewage especially in the beginning of rain, the application of the vertical city planning system under the City Planning Act allowed the construction of office and commercial building (Shinagawa Season Terrace) above the sewerage facilities for effective utilization of land space (Figure 2-1-35).



As for the development costs, the entire construction cost of the above-ground part of Shinagawa Season Terrace is covered by private businesses and the Tokyo Metropolitan Government that operates sewerage facilities does not bear any cost. In addition, the land lease cost paid to the Tokyo Metropolitan Government by private businesses is expected to contribute to the stable management of sewage works.

Also, as for the ingenuity of energy utilization, by making the most of being sewerage facilities, the facilities collect heat from the treated water of wastewater treatment facilities and use as recycled wastewater for toilet water (Figure 2-1-36).



■ Kyoto Tango Railway

Kyoto Tango Railway is a railway that runs Tamba in northern Kyoto, Tango area, and Tajima in northeastern Hyogo. For many years, it was affectionately called Kitakinki Tango Railway Corporation and played a central part as a public transportation connecting regions (Figure 2-1-37).

However, due to dwindling birth rate and an aging population, advanced motorization, leisure diversification and the hollowing of industries, the number of users and transport revenue declined. The number of users in 2013 dropped by about two thirds of the peak in 1993 and the management environment greatly deteriorated. With this, the local governments along the railway, which are two prefectures, five cities and two towns ^{Note 39}, play a central part in aiming for the integration of surrounding areas and the railway for regional revitalization to determine the reconstruction of railway business.

In April 2015, the name was changed to Kyoto Tango Railway. Under the ownership of Kitakinki Tango Railway Corporation (third sector), the railway facilities were introduced with the system of separation between up and down lines by Willer Trains Inc (Figure 2-1-38). Willer Trains Inc. is a subsidiary of Willer Alliance Inc. which runs highway bus business and travel agency. It is expected that they will utilize management knowhow of the same group for operation.

The management philosophy of Willer Trains Inc. aims to achieve the cooperation of traffic network development and town development. For the development of highly convenient traffic network, they work together with bus and tour vessel operators to set up schedule with due considerations to transit and create common free pass, as well as to work with local governments to distribute timetables for residents to promote the use by combining area maps with coupons for local restaurants.

In order to activate the interdistrict exchange, the inauguration event, Daitantetsu Festival was held in one of the three most scenic spots in Japan, Amanohashidate, in May 2015. A number of visitors used the railway to visit the event venue. While the number of passengers was 7,128 people, which is about 200% compared to the same day in previous year. Even surrounding shopping areas saw an increase in visitors to display ripple economic effects.

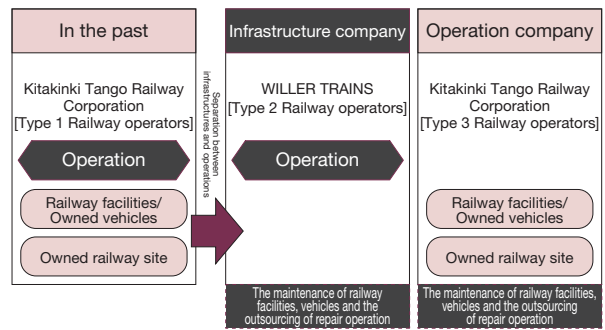
Figure 2-1-37 Railway map of Kyoto Tango



(Source) WILLER TRAINS, INC.

Figure 2-1-38

The two-tiered system of Kyoto Tango Railway



Note 39 Hyogo; Kyoto; Toyooka City, Hyogo; Fukuchiyama City, Kyoto; Maizuru City; Miyazu City; Kyotango City; Ine-cho; and Yosano-cho.

In recent years, a number of tourists from abroad arrive at Maizuru Port, which is the entrance on the Sea of Japan side. The areas along the port also lay stress on the promotion of inbound tourism as the sightseeing zone as part of Kyoto by the Sea. The Kyoto Tango Railway also aims to enlarge the inbound tourism and released one-day railway tickets, as well as the multilingual station symbols on station signs and in-train announcement for international travelers. For the future, they will review the railway schedule with regard to tourist traffic lines and promote exchanges inside the district by adding new train plans and information dispatch.

This is a case that private businesses enter into the management to work on restoring the existing railway business. It is expected that regions get together to realize stable operation of local public transportation and the vitalization of local district as the communities get together as one.

Figure 2-1-39 Sightseeing train Tango Kuromatsu



Source) WILLER TRAINS, INC.

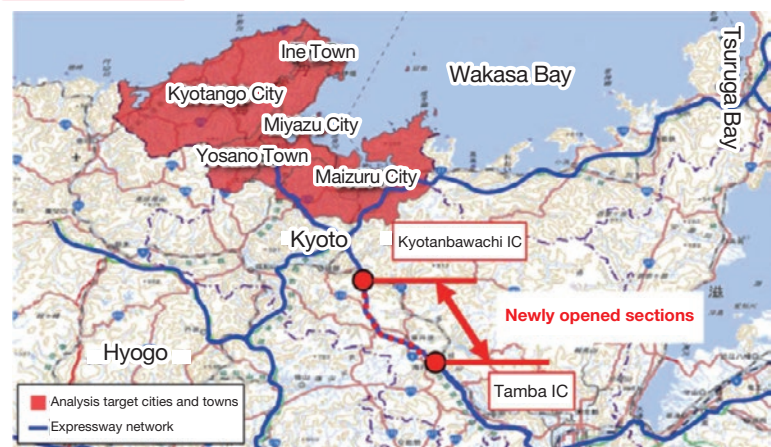
2 “Visualizing” the stock effect

While, in Section 1, we looked at the examples where the stock effect contributed to the firm production activities and regional economics, it is important for the private sector to recognize the effect and take full advantage of the effect. In this section, to clearly show various types of the stock effect brought by infrastructures to the users such as private businesses and people, we introduce examples in which big data and results of user surveys are used to detect the effect objectively.

■ The example of Kyoto Jukan Expressway –Use of big data–

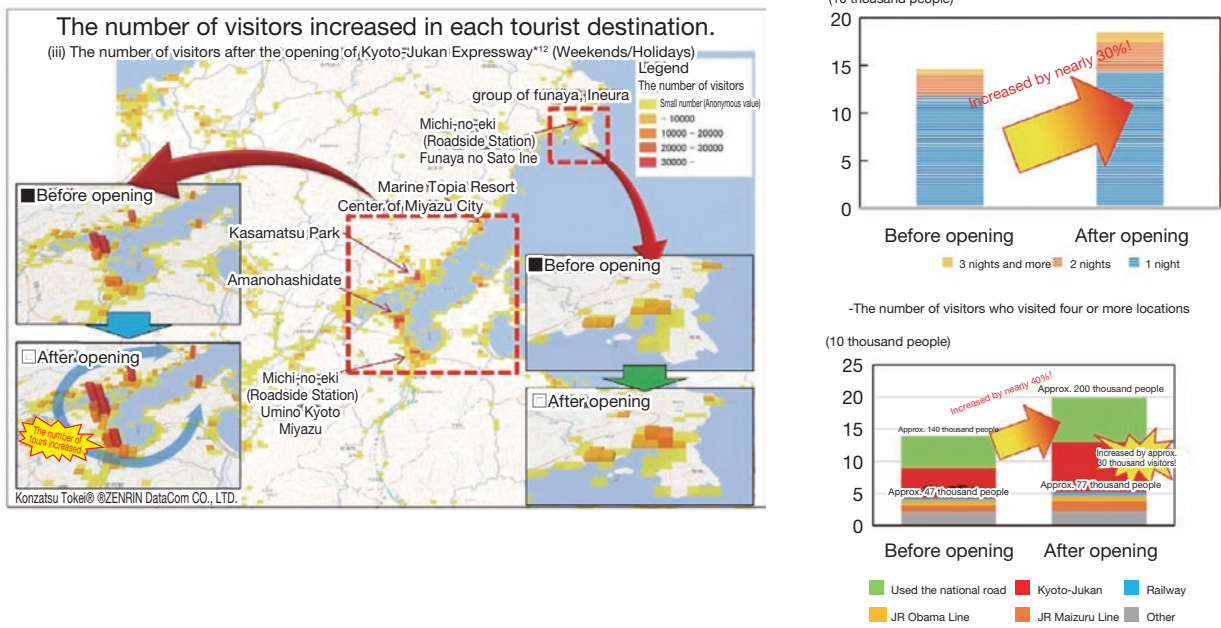
The Kinki Regional Development Bureau uses the big data of location information obtained from mobile phones to analyze the number of visitors in each tourist destination in the northern Kyoto region after Kyoto Jukan Expressway opened in July 2015. This made it possible to analyze in detail the location and the number of visitors, which revealed that the number of visitors increased in each tourist destination (Figure 2-1-40 and 2-1-41).

Figure 2-1-40 Analysis target areas



Source) MLIT

Figure 2-1-41 The number of visitors and hotel guests after the opening of Kyoto-Jukan Expressway (Weekends/Holidays)



(Notes) 1 The number of users is an estimate from the data of Konzatsu Tokei® and does not match other published values.
 2 Date analysis, based on the calculation of location information, estimates the situation of road use and the situation of visiting five cities and towns in northern Kyoto.
 3 The locations visited are counted by the number of locations that they stay for more than 15 minutes within the 250 m mesh.
 4 The period of analysis is from July 18 to September 30, 2014, before opening and July 18 to September 30, 2015, after opening.
 5 The number of visitors is counted targeting those who visited for sightseeing mainly on weekends/holidays.
 Source) Developed by MLIT based on the Konzatsu Tokei® Note 40 ZENRIN-DataCom CO., LTD.

■ The example of Chugoku Odan Expressway (Onomichi-Matsue Line) –Use of survey–

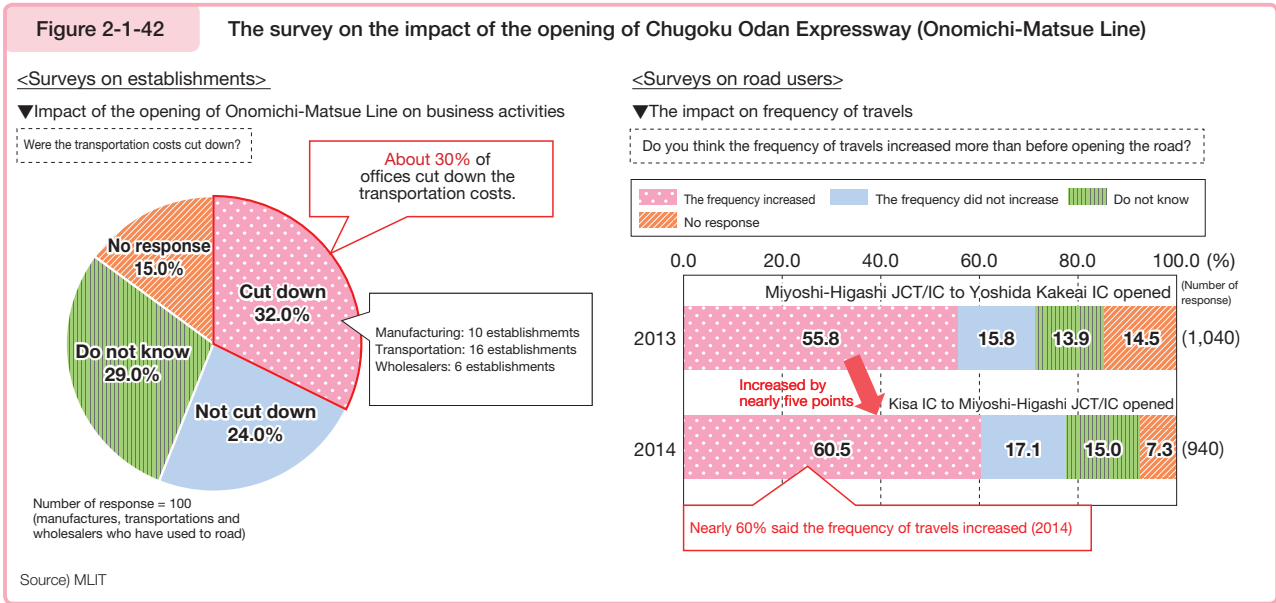
The Chugoku Regional Development Bureau studied the impact of the opening of Onomichi-Matsue Line, Chugoku Odan Expressway, by conducting a survey on local establishments ^{Note 41}, a survey on road users ^{Note 42} and other surveys. Although the surveys were implemented before the entire line opened ^{Note 43}, the survey results showed that the opening of Onomichi-Matsue Line has already helped the business activities in the region, increased the frequency of traveling and other benefits of reviving tourism. They concluded the surveys found various impacts of the infrastructure investment (Figure 2-1-42).

Note 40 The Konzatsu Tokei ® data is the data that holistically and statistically processed the location information of mobile phones transmitted after obtaining permission of auto GPS function users of the Docomo Map Navi service provided by NTT Docomo. The location information is GPS data (lat/long information) measured every five minutes at the earliest and does not include information that identifies an individual such as gender and age.

Note 41 The survey was conducted targeting 1,118 establishments of Shimane and Hiroshima from November 21, 2014 to December 15, 2014. The survey was mail and collected by mail. The numbers of response were 228 (response rate of 20.4%).

Note 42 The survey was conducted targeting visitors of 21 tourist facilities in Shimane and Hiroshima from October 12, 2014 to October 26, 2014. The survey was distributed by hand and collected by mail. The numbers of responses were 7,261.

Note 43 The entire routes opened on March 22, 2015.



Column

Ripple effects of improvement in the infrastructure, and understanding of wider impacts overseas.

So far, it has been explained that various stock effects are caused by improving the infrastructure. Among these stock effects, for example, an improvement of the transportation infrastructure brings about ripple effects to the outside of traffic markets, such as production expansion and more plant sites, as well as direct effects (effects within traffic markets), such as shorter required time.

In the cost-benefit analysis underway in Japan, only the direct effects are measured on the premise that such ripple effects are all offset if the market is perfectly competitive, so the traffic market can be measured with direct effects.

In the meantime, it is known that there is actually an agglomeration effect referring to that it is more efficient to gather economic activities in a certain area than to scatter them geographically. It can be said that the improvement of the transportation infrastructure connects geographically separated sites, so it facilitates communication and exchanges among enterprises, and brings about agglomeration economies ^{Note}.

We can also say that the markets in the actual economies are geographically separated by a certain distance, so perfect competition is not always working. For example, it is sometimes found that, while gas stations in the neighborhood in competitive cities try to lower prices, gas stations in uncompetitive depopulated areas offer high prices.

These external agglomeration economies and geographical imperfect competition attracted attention. Thus, in the past 10 years, when conducting the economic analysis of the impact of streamlining the infrastructure, initiatives to analyze effects called the *wider economic impacts*, in addition to the conventional cost-benefit analysis, have spread among governments of the United Kingdom, New Zealand, Sweden, and other countries.

Specifically, in the United Kingdom, analyses of (i) agglomeration effect, (ii) changes in production activities

Note For example, Bernard, Moxnes, and Saito (2014) states, after analyzing changes in production network of Kyushu and other areas after construction of the Kyushu Shinkansen, that even the preparation of a network that transports only passengers, not cargoes, has important effects on the sales of enterprises.

in the imperfectly competitive markets, and (iii) benefits to which tax revenue effects caused by the influence on the labor market were added. (Figure 2-1-43).

Even this measurement of *wider impacts* cannot cover all the stock effects of the infrastructure, such as the improvement in safety and security and the expansion of the diversity of consumers. However, looking to these initiatives overseas,

we can say that a stance to capture effects following changes in traffic beforehand or afterward is necessary instead of always relying on figures based on a conventional cost-benefit analysis alone.

Figure 2-1-43 Benefits and costs of British Crossrail (100 million pounds)

Net cost for the government	89.6
Total cost	139.02
- Net revenue from railway	- 61.49
+ Indirect tax revenue decline	12.07
Conventional user benefits	160.93
Leisure/Commuting traffic	112.29
Business traffic	48.64
Wider impacts	71.61
Accumulated benefits (the accumulation knowledge and technology associated with increased benefits, etc.)	30.94
Incomplete competition (In the incomplete competition market, the impact of decreased travel cost is caused greatly)	4.86
Travel of workers (Tax revenue increase associated with the decline of travel costs)	32.32
An increase of labor force participation rate (Impact of increased labor force)	3.49

Source) Developed by MLIT from Economic Appraisal of Crossrail 2005, Crossrail Ltd., (2005).

3 MLIT's approaches toward maximizing the stock effect

The fourth Priority Plan for Infrastructure Development was decided by the cabinet on September 18, 2015, which aimed at maximizing the stock effect as the first principle. Based on the plan and under strict financial restrictions, the MLIT started the infrastructure management strategy of “smart investment, smart use”, which means selecting and focusing thoroughly on the projects that carry a strong stock effect and talking full advantage of the existing facilities with wise and ingenious attempts. Also, as part of assessment for the plan, the Special Working Group was established under the Traffic System Subcommittee Planning Section, the Panel on Infrastructure Development and Transportation Policy Council to discuss the efforts to maximize and “visualize” the stock effect. Its reports will be compiled around fall 2016.

As part of its effort, the MLIT and the Japan Business Federation set up a panel to encourage the dialogue of public-private partnership.

Additionally, to disseminate the efforts for amplifying the stock effect in various areas, the ministry compiled a collection of case studies about the infrastructure stock effect in each prefecture (Figure 2-1-44) and a collection of advanced case studies across the country for the efforts of “smart use” and integration and reorganization of existing facilities. The ministry and the Regional Development Bureau also hold panel exhibitions for introducing these initiatives. Besides, the Kanto Regional Development Bureau archived the records of ex-post evaluations as “Kanto Infrastructure Project Archives” ^{Note 44} (Figure 2-1-45) to share the information for the future infrastructure projects and to plainly show the general public the efforts they made over the entire infrastructure projects.

Figure 2-1-44

A collection of case studies of the stock effect

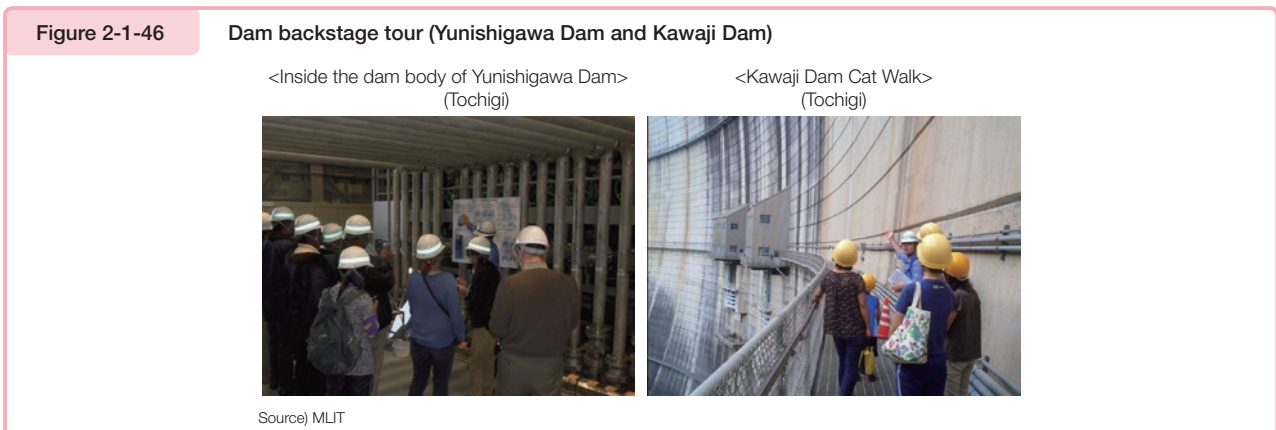
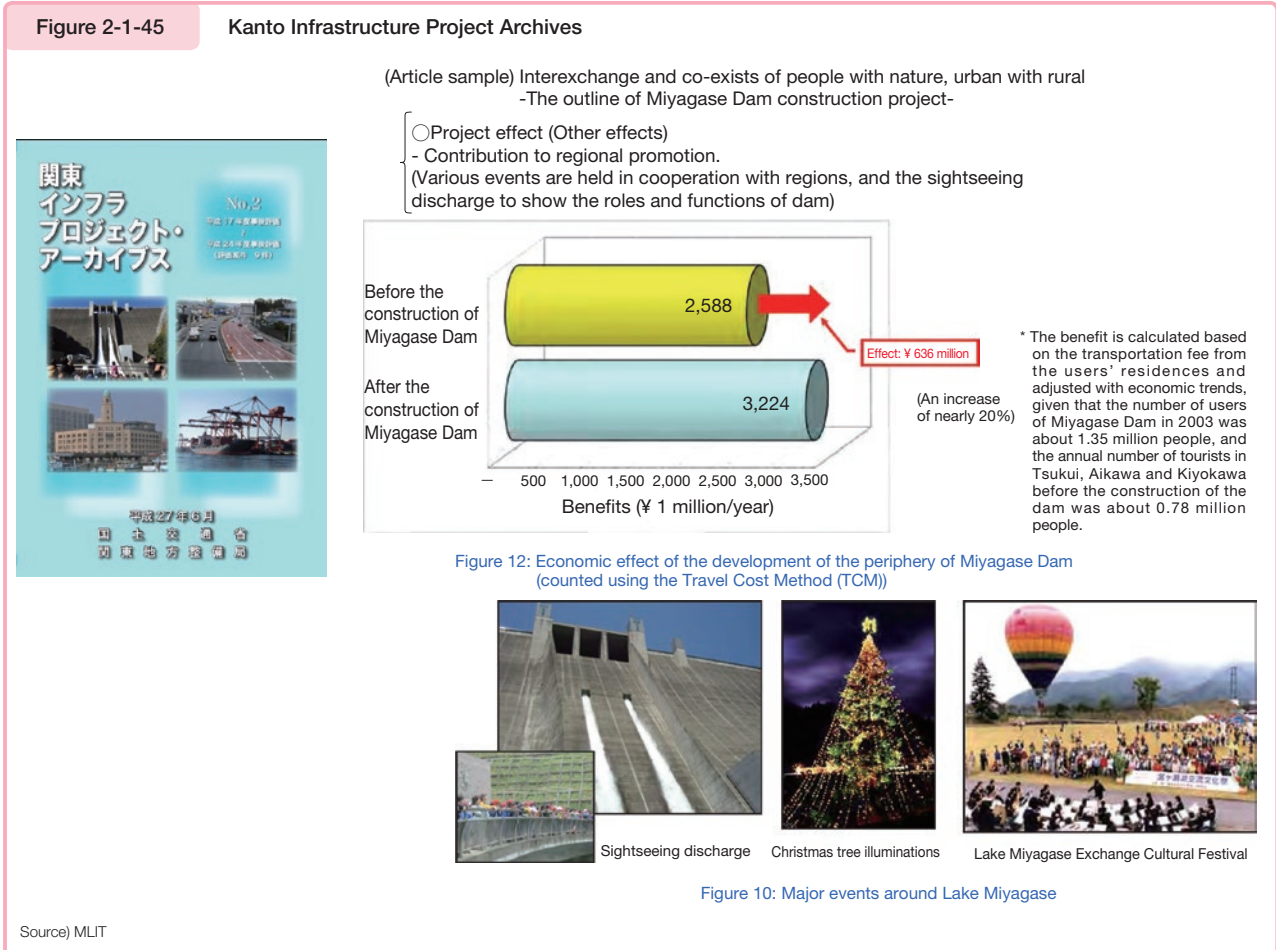


Source) MLIT

Note 44 <http://www.ktr.mlitt.go.jp/shihon/index00000018.html>

In addition, to arouse people’s feeling of closeness with the infrastructure along with the local development, the ministry promotes infrastructure tourism ^{Note 45}. The infrastructure tourism uses bridges and dams as tourist resources to motivate users and tourists to enjoy experiencing infrastructure while offering an illustrative description of the stock effect to help them deeply understand how the effect works (Figure 2-1-46).

In sum, offering and sharing information in a comprehensive manner (namely “visualizing”) allows the users to understand the stock effect easily.



Note 45 The MLIT opened a portal site in January 2016 for introducing infrastructure tours across the country. (<http://www.mlit.go.jp/sogoseisaku/region/infratourism/index.html>)

Section 2 Effective Development and Operation of Infrastructure Through Public-private Partnership

As described in Section 1, the proper development of infrastructure has an effect to promote the activation of private investment and vitalization of the local district. For the efficient and effective infrastructure development, the public-private partnership is also valid to incorporate private funds and ingenuity. With the utilization of PPP/PFI, the businesses that were previously in charge of public entities open up to the private sector to spark up new private demand. At the same time, with the utilization of the private funds, management knowhow and technical capabilities, the promotion of streamlining services and rising service levels are expected. In the latter part, we introduce the approaches of PPP/PFI.

1 Domestic PPP/PFI market

(1) The situation of PPP/PFI utilization

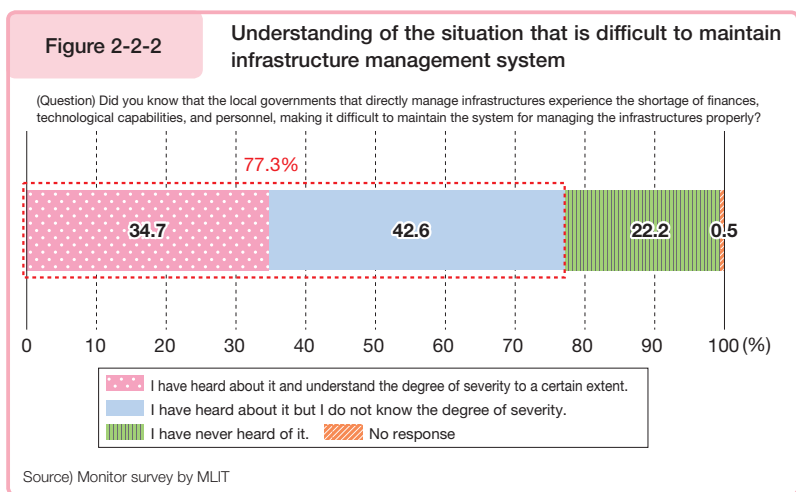
The PPP (Public Private Partnership) is the concept that the method of private participation is captured extensively in some way within the public service provision and there are various categories depending on the involvement of the private sector. Some of the representative examples include PFI (Private Finance Initiative) and comprehensive work consignment to private sector (Figure 2-2-1).

Figure 2-2-1 Major PPP methods

Methods	Summary	Basis laws	Facility ownership	Funding	Example of deployment field
PFI Method	A method to construct, maintain, manage, and operate public facilities through utilization of private finance, management abilities and technical capabilities.	PFI Act (1999)	Government/ Private	Private	Publicly owned residential and government buildings, etc.
Concession method	Concession is grant of rights to the private business to operate the public facilities that collect (usage) fees while the public entity continues to possess their ownership.	PFI Act Amendment (2011)	Government	Private	Airport, Road Sewage system, etc. (scheduled)
Designated administrator system	A system in which a designated administrator (corporations that local governments designate) acts over the management and operation of public facilities. Due to a legal reform, the management (entity) of the public facilities is opened up extensively to private businesses, NPO organization, etc.	Local Autonomy Act Amendment (2003)	Government	Government	Parks, ports and harbors, etc.
Comprehensive work consignment to private sector	Regarding management and operation duties of public facilities and the like, by refraining from determining the details of the operation of business and according to the efficiency-ordering method in which the operation is outsourced to a group of private industries, one may provide effective services that capitalize on the creativity and ingenuity of the private sector.	—	Government	Government	Sewage, etc.

Source) MLIT

In the monitor survey, when we surveyed the recognition of people about the difficulties of infrastructure management by local governments due to insufficient human resources and financial reasons, 77.3% of the respondents answered that they have heard about it (Figure 2-2-2). In addition, nearly 79.5% of the people think it is important or slightly important to user private funds for the development of infrastructure, indicating that the necessity of public-private partnership is recognized among people (Figure 2-2-3).



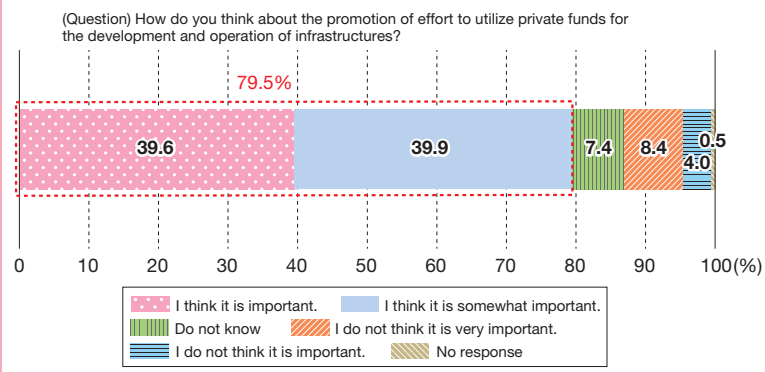
The representative method of public-private partnership, PFI, is implemented by the private sector in charge of business financing. Since the formulation of the Act on Promotion of Private Finance Initiative (PFI Act) in July 1999, the number of PFI projects and project costs are on the rise year after year. In FY 2014, the number of projects was 489 and the project costs reached ¥4,501.5 billion. The results related to the Ministry of Land, Infrastructure, Transport and Tourism sum up to 151 cases as of January 1, 2016, and the number of projects implemented by local governments indicates a larger spike among business entities (Figure 2-2-4).

In the past, the related projects of the Ministry of Land, Infrastructure, Transport and Tourism using Japan's PFI are mainly government buildings and public housing, and there are a fewer cases of utilization in roads and sewage works. In addition, there are 114 cases of the service-purchase type, in which the project formats by investment recovery are that the cost of public facilities maintained by the private sector and the cost of maintenance, management and operation are paid by public entities as compensation (service purchase price), which account for 75% of all (Figure 2-2-5).

Besides the service purchase type described earlier, the business types of PFI include a financially independent type, which the funds are recovered by the revenues from the facility use and a mixed type that the funds are recovered from both service purchase cost and facility use fee. With the financially independent type, while the operation risks are borne by the private sector, they can set up use fee and service content. Compared to the service-purchase type in general, there is larger room for ingenuity.

Figure 2-2-3

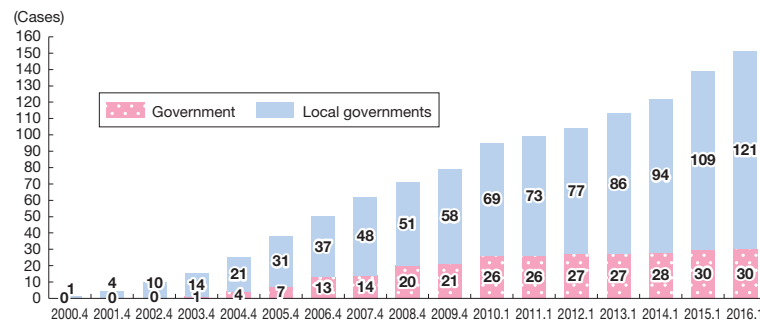
The awareness of the utilization of private funds in infrastructure development



Source) Monitor survey by MLIT

Figure 2-2-4

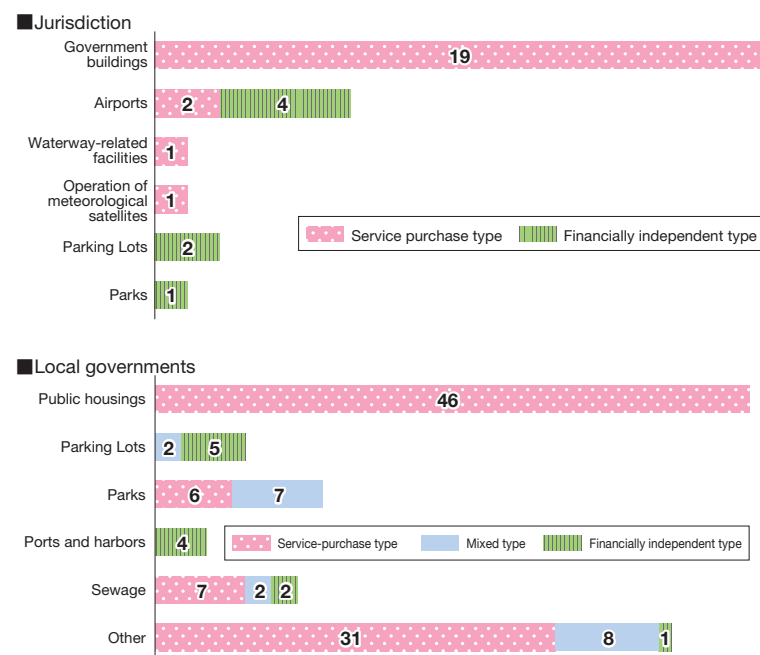
Changes in the number of businesses (Accumulated total)



(Note) The total is counted based on fiscal year before 2009 and calendar year after 2010.
Source) MLIT

Figure 2-2-5

The number of businesses by business category (As of January 1, 2016)



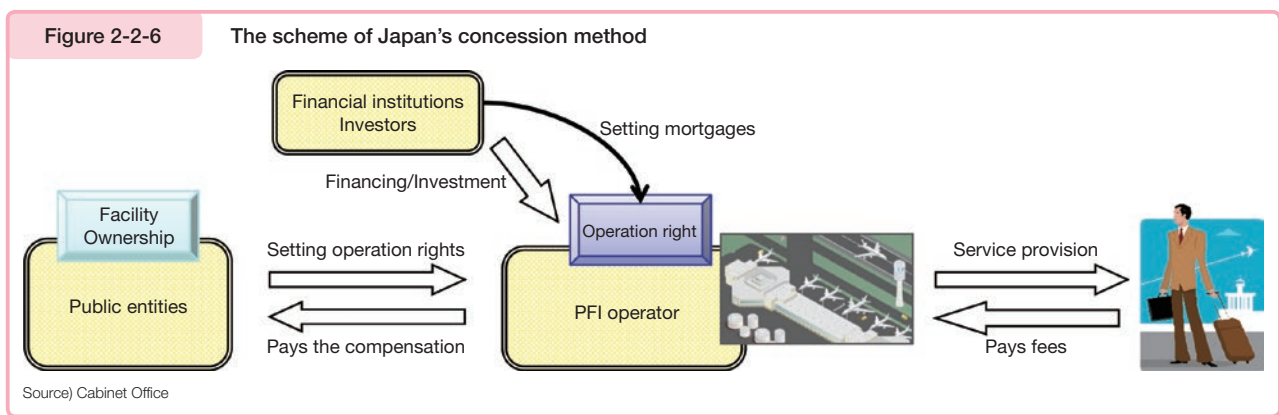
Source) MLIT

(2) Approaches of introducing PPP/PFI

With the diversification of needs for infrastructure and services, the key is to incorporate PPP method that matches with the purposes of each project and actual condition in the region. The latter part introduces a representative case of effective PFI method, called a concession method (operation right system such as public facilities) and the approaches of PPP introduction through comprehensive work consignment to private sector in rural regions.

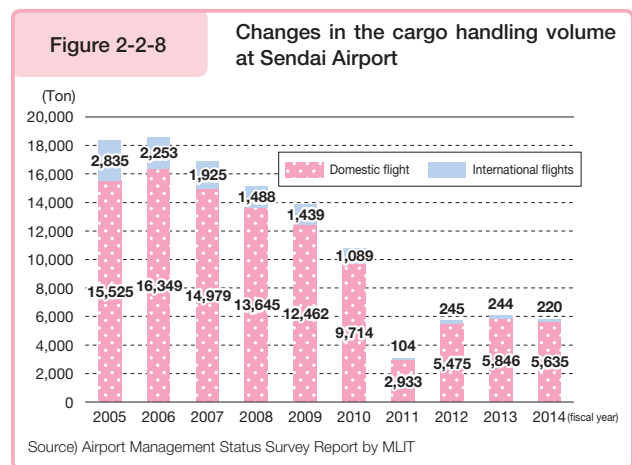
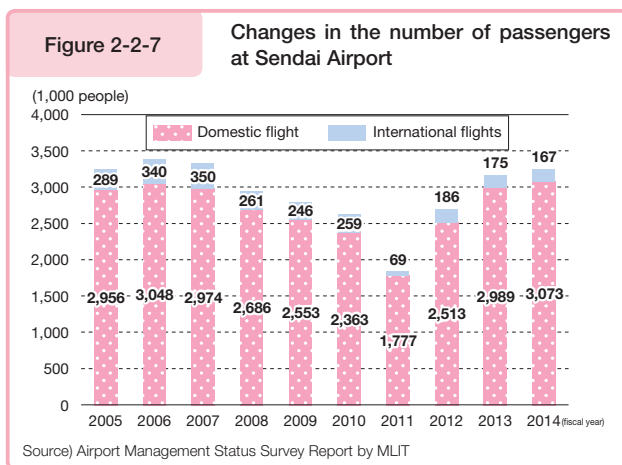
(Concession method (the operation right system for public facilities))

The concession method is a method that was introduced by the revision of PFI Act in 2011. It is the project that the private sectors operate facilities while the public entities hold the ownership of the public facilities that collect usage fees (Figure 2-2-6). This is a financially independent type project that the funds are collected with toll revenue from facility users. Under the ownership of the public entities, while a certain level of public nature is maintained, it allows for the operation with a high degree of stability and freedom to provide high quality services that reflect the needs of users. Mainly, it is introduced in airports, sewage facilities, and toll roads.



■ Sendai Airport

Government-managed Sendai Airport was faced with a sluggish growth of the number of passengers and the cargo handling volume after peaking in FY 2006. With the reconstruction from the Great East Japan Earthquake of March 2011 as a symbol, the expectations toward Sendai Airport were on the rise (Figure 2-2-7 and 2-2-8). For that reason, while incorporating the knowhow from the private sector for airport operation, the airport, and surrounding facilities are managed comprehensively, the potentials of the Tohoku region are maximized, and by implementing the integrated operation of the region and airport, they aimed for the revitalization of the Tohoku region.



In this project, the consideration of integration of public-private partnership began with the compulsion from Miyagi around 2012. In March 2013, they formulated the future image of Sendai Airport and surround areas of the airport, which is the common principle for the public-private partnership. As the goal after 30 years from the realization of private operation entrustment of Sendai Airport, the goal was set to reach 6 million passengers annually and 50,000 tons of cargo handling volume annually. In addition, in June 2013, with the formulation of the act on the operation of national government administration airports that utilize the capabilities in the private sector, it allowed the clarification of framework for concession method in the airport, which also pushed forward discussion on a full scale. With such public-private partnership cooperation, it formulated a clear vision in operating airports and advanced the formulation of laws. In June 2014, the public invitation for the concession method began.

On December 1, 2015, up to 65 years of the operation right was given to Sendai International Airport Co., Ltd., established by the Tokyu Maeda Toyota Tsusho Group, for the first 30 years (Figure 2-2-9). The project proposal of this company was to enhance the international flights, expand the commissioned routes by the introduction of price system that motivates airlines to enter service and to enlarge the demand for air by transmitting the Tohoku brand actively. In addition, with the constructing traffic networks originated from Sendai Airport, the aim is to improve the accessibility to each part of Tohoku and the ripple economic effects (Figure 2-2-10). This case is the first project of introducing the concession method at an airport. In the future, the activation in the Tohoku region is expected by the airport operation, in which the public-private partnership and region come together.

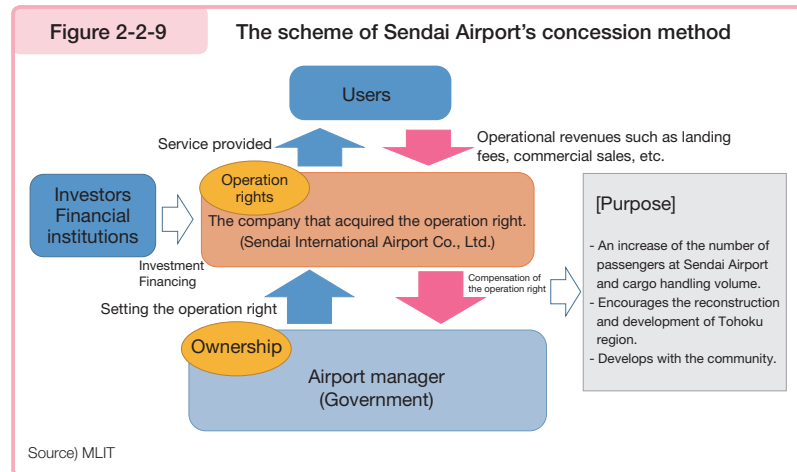


Figure 2-2-10 The business implementation policy of Sendai International Airport Co., Ltd. (Main)

Aviation related business
- Encourages airlines to go into service by reducing the fees paid by airlines.
- Expanded aviation networks in Japan and overseas by increasing direct flights within the sphere of four hours for international flights.
- Enlarging equipment for hub airports and daily service operation to establish transport routes.
Non-aviation business
- Enhancement of commercial facilities such as goods sales and restaurants that transmit the Tohoku brands.
- Sets up an exchange plaza for local residents and arrival cafes for pickup visitors and passengers.
Other
- Congestion mitigation by increasing accessibility of railway networks and enhancing parking facilities (improved convenience of airport access)
- Cooperation of the Sendai Airport internationalization utilization promotion council and Tohoku Tourism Promotion Organization (transmission of the Tohoku brands)
- Setting up a Sendai Operation Center that specializes in comprehensive operation and safety operation of the airport and ancillary facilities. (Safety and maintenance structure)

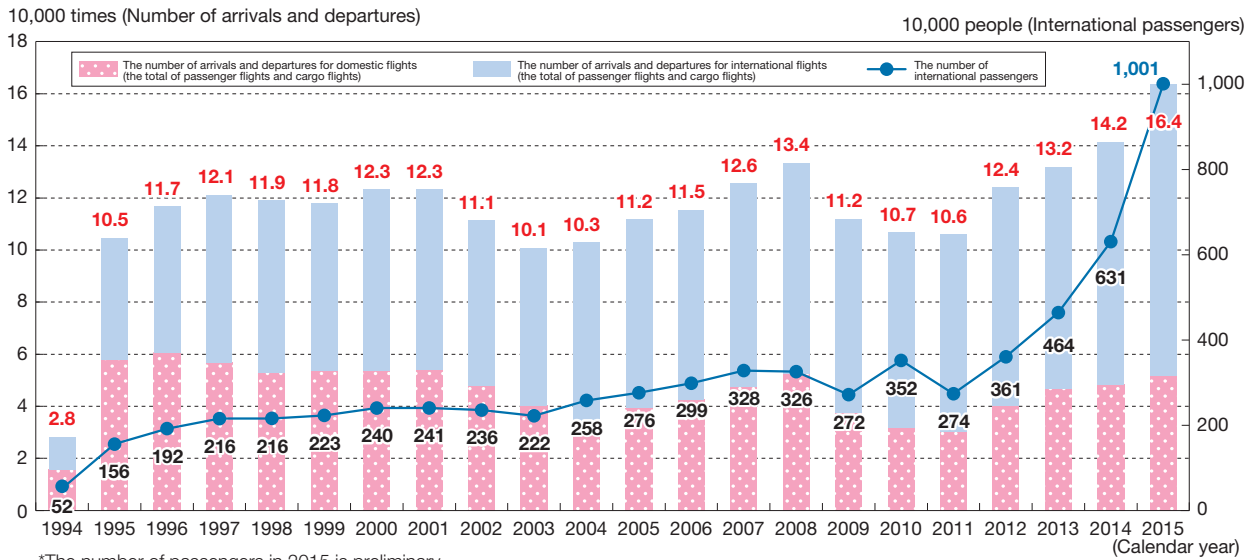
Source) Developed by MLIT based on the outline of proposal by Tokyu Maeda Toyota Tsusho Group.

■ Kansai International Airport and Osaka International Airport

As for Kansai International Airport (KIX) and Osaka International Airport (Itami), based on the Acts on integrated and effective establishment and management of Kansai International Airport and Osaka International Airport (Act No. 54 of 2011), the aim was to utilize the concession to make the maximum use of the knowhow of private businesses to repay the debt related to the construction of KIX at an early stage and with sureness. In addition, another aim was to restore and strengthen as the international hub airport in Kansai, as well as through the proper and effective use of both airports of KIX and Itami, the entire Kansai would see an increase in demand for air transport.

Figure 2-2-11

Changes in the number of arrivals and departures at Kansai International Airport and the number of international passengers



*The number of passengers in 2015 is preliminary.

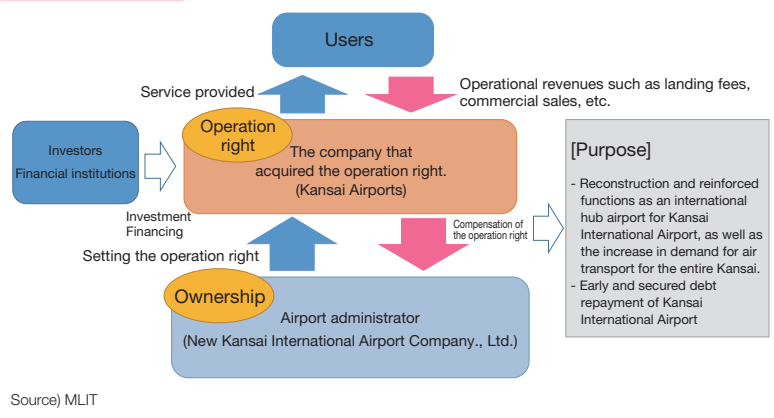
(Source) New Kansai International Airport Company, Ltd.

First, New Kansai International Airport Company, Ltd. was established (100% government funded) in April 2012 and in July of the same year, the management of KIX and Itami was unified. For the realization of concessions, New Kansai International Airport Company formulated the management strategy and the action plan, which is the medium-term management plan, to work on further improving the business values of both airports. In July 2014, the Implementation Policy on the Special Airport Operation of Kansai International Airport and Osaka International Airport was formulated and published to begin the procedure related to the public offering of private businesses. In November 2015, Orix Corporation and French airport operation company, VINCI Airports, were selected as the main members of the consortium with the first refusal right. In December of the same year, the operation right was set to Kansai Airports established by the consortium to conclude the implementation agreement with New Kansai International Airport Company.

The period of concession lasts for 44 years from April 2016 to March 2060. The compensations of operation right are paid each year by Kansai Airports from landing fees and airport operation revenues such as commercial sales (Figure 2-2-12). In addition, while Kansai Airports implements business in accordance with the implementation contract and the demand level indicated by New Kansai International Airport Company, without any hindrance to airport operations. On the other hand, New Kansai International Airport Company must provide monitoring to check proper airport operation is maintained.

Figure 2-2-12

The scheme of concession method of Kansai International Airport and Osaka International Airport.



(Source) MLIT

According to the business implementation policy provided by Kansai Airports, by strengthening marketing function and drawing routes by setting strategic price and promoting LCC business, they aim for the rise in revenues by layout changes of commercial facilities in the non-airplane related business, to present the enlarged revenues that utilize the company's own knowhow besides strengthening the airplane related business (Figure 2-2-13).

In addition to the transport of passengers and cargo, which is the original purpose, the airport operation requires various capabilities such as the operation of commercial facilities and hotel facilities. This case is a project that overseas companies with the experience of airport operation work with Orix and other Japanese companies that are representative in the region hand in hand and allows the development of airport business with flexible ingenuity of private businesses. With this, both airports are expected to develop more than before to contribute to the increase in demand for the airport in Kansai to stimulate the enhancement of international competitiveness such as Japanese industries and tourism, as well as the activation of economy in Kansai.

Figure 2-2-13 The business implementation policy of Kansai Airports (Main)

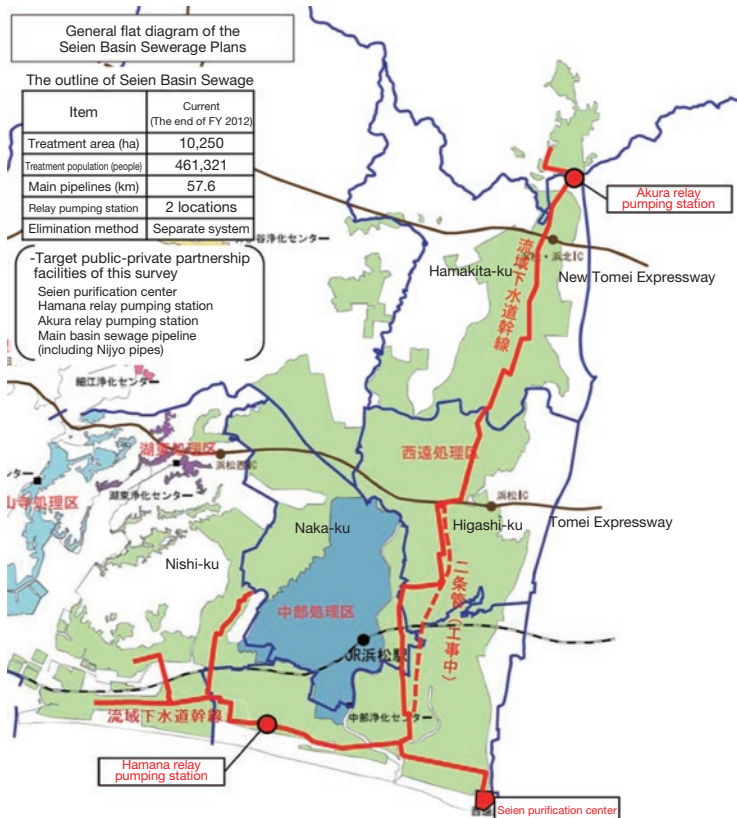
Aviation related business
- Further attraction of routes by reinforcing marketing functions
- Creating LCC centers and logistic base.
Non-aviation business
- Enlarged commercial revenues with the changes of facility layouts for customers to shop easily.
- Maintenance of aircrafts and other comprehensive and effective service provision for airlines.
Other
- Promotion of new construction of simple accommodation facilities that target passengers arriving early in the morning due to an increase in LCC flights. (increase satisfaction for passengers)
- Human resources development
- The operations previously implemented by New Kansai International Airport Company., Ltd. and the safety standard of maintenance management and secured implementation of renewed investment. (Safety Measures and capital investment)
- Promotion of activities that connect the surrounding areas and the airport (environmental measures and coexistence with the community)

(Source) Developed by MLIT based on the materials provided by New Kansai International Airport Company., Ltd.

■ Hamamatsu Public Sewerage End Treatment Plants (Seien treatment district)

After the consolidation of municipalities in 2005, it was decided that the Seien basin sewerage works managed by Shizuoka would move to Hamamatsu City. Although it was moved in April 2016, Hamamatsu City was faced with issues such as the transfer of maintenance and management skills due to a decline in staff. In addition, because proper maintenance update of the facilities due to aging was required, they also expected a decline in usage fee revenues due to a population decline. Because of this, they were considering the optimization of a project using public-private partnership.

Figure 2-2-14 The outline of Seien sewerage in Hamamatsu City



(Source) Developed by MLIT based on the materials provided by Hamamatsu City

As the efficient management with a long-term contract and the operation that utilizes ingenuity of private sector were expected, they considered the introduction of concession method and in the end, they have decided to introduce partial concession that sets up operation rights for a water purification center and pump station. For the scope of work, in addition to the maintenance and management of the facilities and renovation, they recognize the financially independent project such as the introduction of new treatment process and solar power generation (Figure 2-2-15).

In addition, for renovation, based on the list up of eligible facilities set by the private sector, the city will formulate renovation plans. The renovation costs will be mainly sourced by the city from enterprise loan ^{Note 46} and national expenses while the private sector also bears a burden to give an incentive for suppressing project costs.

For the first two years after transfer, they subcontract and after 2018, they will begin operation under the same system.

Japan’s sewage facilities are at the point where major renovation is required due to aging. Many local governments have the similar issue as Hamamatsu City. On the other hand, sewage works have little prospect of breaking even and management and risk sharing are difficult. By utilizing the concession method flexibly, the ingenuity of private sector is incorporated to reduce the financial burden of local governments.

■ Aichi Prefectural Road Public Corporation

For the introduction of concession method for toll-road businesses implemented by the regional road corporation, the ordinary session of the Diet in 2015 established and enforced Partial Revision of the Act on Special Zones for Structural Reform that enables private businesses to operate public-managed roll roads.

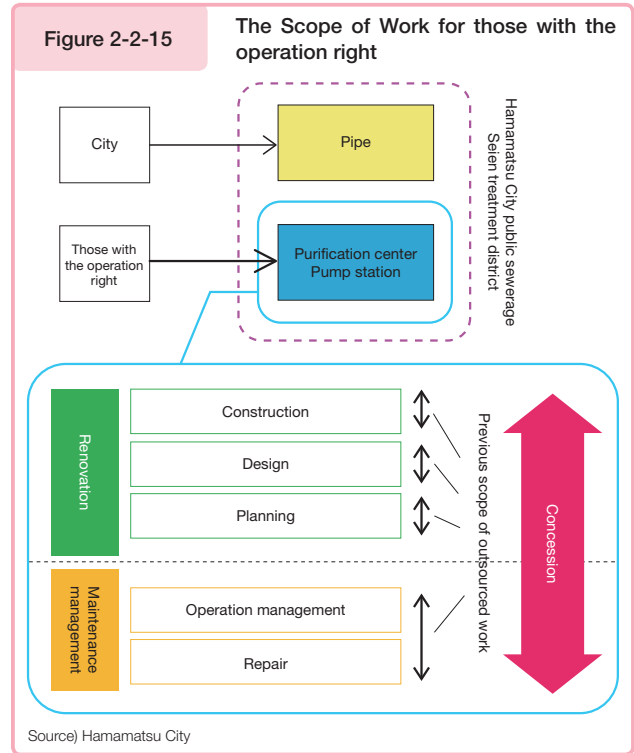
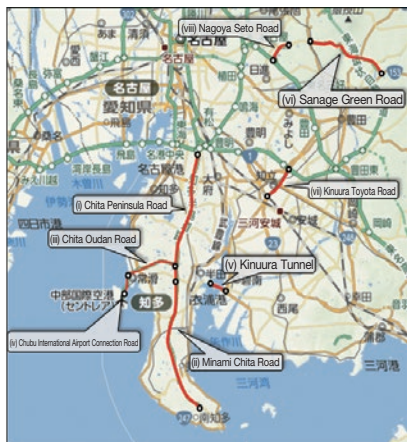


Figure 2-2-16 Toll roads eligible for the project and toll collection period



Names of roads	Extension (km)	Toll collection period
(i) Chita Peninsula Road	20.9	1970. 7. 15 ~ 2028. 2. 1 (Note)
(ii) Minami Chita Road	19.6	1970. 3. 1 ~ 2028. 2. 1 (Note)
(iii) Chita Oudan Road	8.5	1981. 4. 1 ~ 2028. 2. 1 (Note)
(iv) Chubu International Airport Connection Road	2.1	2005. 1. 30 ~ 2035. 1. 29 (Note)
(v) Kinuura Tunnel	1.7	1973. 8. 1 ~ 2029. 11. 29
(vi) Sanage Green Road	13.1	1972. 4. 1 ~ 2029. 6. 22
(vii) Kinuura Toyota Road	4.3	2004. 3. 6 ~ 2034. 3. 5
(viii) Nagoya Seto Road	2.3	2004. 11. 27 ~ 2044. 11. 26
Overall	72.5	1970. 3. 1 ~ 2044. 11. 26

(Note) Four routes will be pooled on October 1, 2016, and the period of toll collection ends on March 31, 2046.
Source) Developed by MLIT by materials provided by Aichi.

Note 46 It is a long-term debt borrowed from the government to provide for the funds for the construction of pipelines, facilities, and improvement projects.

In August 2015, Aichi was specified as a National Strategic Special District and in September, the National Strategic Special District plans ^{Note 47} was certified. After that, the Aichi Prefectural Road Public Corporation published an Implementation Policy in October and a list of requirements in November. The scope of operation project of toll roads in Aichi is to maintain and manage the operation right for established eight routes (Figure 2-2-16) as well as its administration operations, and other operations incidental to the renovation operations and the sale of shops in existing parking area. At present, they are in process of selecting operators.

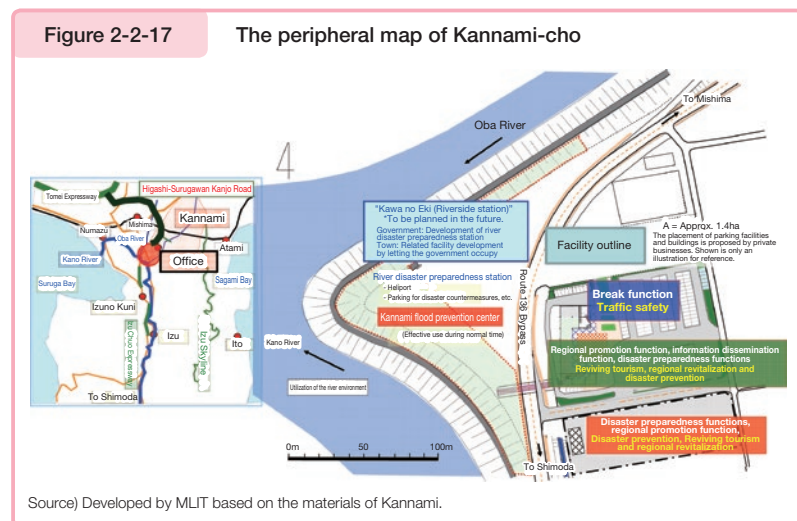
(The public-private partnership in community development)

In rural cities, as a method for the response to financial restrictions and regional economic vitalization, they introduce PPP in a positive manner. Also, the forms come in variety and they introduce a method that meets regional characteristics and business purpose. In the process, the communication with private businesses and residents becomes important. The following introduces the approaches taken in each area.

■ Kannami-cho regional revitalization, exchange and disaster-prevention bases improvement project (BTO ^{Note 48} method, mixed type)

Kannami, Shizuoka, is situated in the north of Izu Peninsula with rich tourist resources and in FY 2013, after Higashi-Surugawan Kanjo Road extended to the Kannami Tsukamoto IC; the traffic convenience was improved from Tomei Expressway to the New Tomei Expressway. In Kannami, in time for the development of the ring road, it is assumed to serve as an entrance to the Izu Peninsula and become the overall tourist base for Izu. They were promoting city development for creating live city by adding a base for information dispatch for the eastern part of Shizuoka and the entire Izu Peninsula. Also, the area is expected to see a magnitude 8-Tokai Earthquake and Nankai Trough Mega Earthquake and the route 136 that runs through the city is positioned as emergency transport roads.

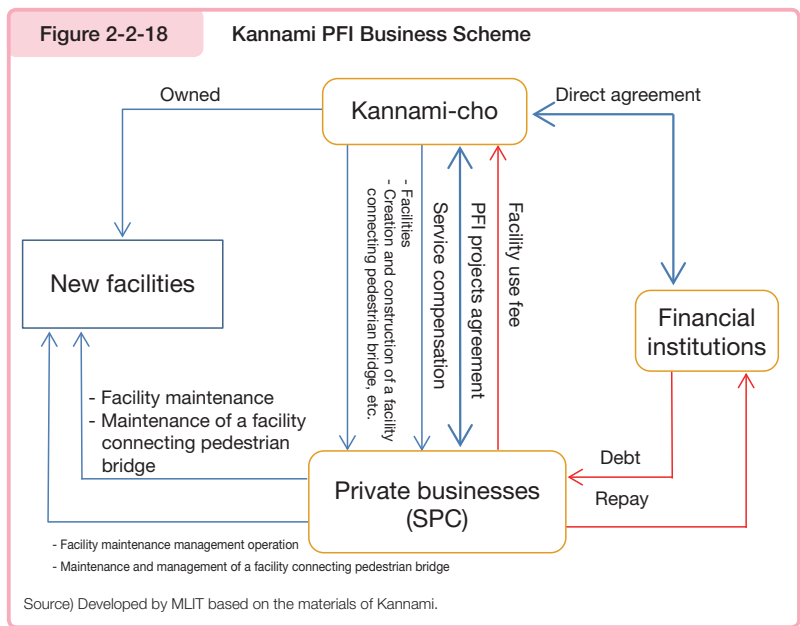
In light of such background, the city discussed on working harmoniously under the public-private partnership to maintain and operate facilities that combine traffic safety function, reviving tourism, regional revitalization function and disaster prevention functions. In FY 2012, aiming for commercialization, they took advantage of the government's pioneering PPP support projects to conduct the entrustment of investigation for the project. This allowed public-private partnership to implement risk sharing to meet the detail of disaster, business scheme for the optimization of roles in regional revitalization. Also, the mayor led the consideration of small council group for promoting the development of Michi-no-Eki (Roadside Station) and Kawa-no-Eki (Riverside Station) to decide on the implementation of the PFI method for the project.



Note 47 For the special measures to the regulations in the Special zone for Structural Reform, the utilization is possible by providing in the National Strategic Special District and receive accreditations from the prime minister.

Note 48 It is an abbreviated name for Build Transfer Operate. It is a business method that private businesses construct facilities, etc. and immediately after the completion of facilities, the ownership is transferred to the managers of public facilities to allow private businesses to conduct maintenance, management, and operation.

In August 2014, the implementation policy was published to adopt the BTO method for the project. The project runs from 16 years and five months from November 2015 to April 2032, and the facility development period is about a year and five months and 15 years of development, management, and operation. Although Kannami-cho pays maintenance fees, development, management and operation fees to the operators, in order that the private sector can utilize their originality, the operation business of shops and restaurants uses the Financially independent type, in which operators directly receive income from users (Figure 2-2-18). This allowed proper operational management by the government and creation of lively ambient and reactivation of industries through the use of local produce tourist resources by the private sector.



For the recruitment, in order to increase the motivation of private businesses to make an entry, it raised ideas from the private sector before the announcement of implementation policy prior to publish it. For the actual screening, the interview for private businesses are emphasized to give high scores for business suggestion. In addition, while the operation comes in various forms, it allows releasing stocks between investors so that the most suited corporation can become a representative in each stage during the period of design, construction, maintenance, management, and operation for the investment of SPC consisting the project. These efforts attracted two SPCs and the operators were selected in July 2015. The selected SPC consists of local companies and the corporations in the metropolitan areas with the knowhow of PPP/PFI, which allows for efficient operation and local companies to accumulate knowhow and the vitalization of the local district.

This case increases the interest of private businesses and local residents through the dialogue of public-private partnership from the project planning stage. At the same time, the effort is expected to form an exchange base that regions work together and vitalizes the local district. At present, it is in progress for commercialization.

■ Miyazaki West Exit Renovation Project (Effective Utilization of Public Real Estate)

Miyazaki and Miyazaki City were considering the utilization of undeveloped prefectural and municipal land in front of Miyazaki Station, to build commercial facilities, resident service facilities and a traffic center that serves as a nodal point in the central urban area for the activation of central urban area. For the development and operation of commercial facilities, the method of public-private partnership method is introduced to form an implementing entity of Miyazaki Green Sphere Purpose Companies (TMK) funded by a dozen or two local companies.

Figure 2-2-19 The division of roles in private partnership

Division		Government	Private
Public facilities	Design	○ (Bus terminal, municipal bicycle parking)	○ (Inside Ichibankan, Public Space ^{Note})
	Construction	○ (Bus terminal, municipal bicycle parking)	○ (Inside Ichibankan, Public Space)
	Maintenance management	○ (Bus terminal, municipal bicycle parking)	○ (Inside Ichibankan, Public Space)
	Operation	○ (Bus terminal, municipal bicycle parking)	○ (Inside Ichibankan, Public Space)
Private facilities	Planning	○	○
	Design		○
	Construction		○
	Maintenance management		○
	Operation		○

(Note) Phoenix square, KITEN square
Source) MLIT

The project period is twenty years from March 2010 to February 2030 to develop and operate facilities such as public facilities such as bus terminals and open space, and a complex that has hotels, commercial facilities, and offices, as well as private facilities such as multistory parking garages by sharing roles under the private partnership (Figure 2-2-19).

In addition, for the facilities developed and operated by TMK, a fixed-term land leasehold for businesses is set to the land owned by the city and prefecture, which serves as bottomland, and the ownership of facilities is set to TMK (Figure 2-2-20).

With these private funds and the incorporation of knowhow, it allows developing spacious space that makes consideration for local residents and facilities and planning the effective attraction of tenants for office facilities, creating new employment, and commercial ground. The effort of vitalizing the central urban area by Miyazaki City including this development, the satisfaction of citizens toward Miyazaki City's commercial environment and appeal improved after the opening of these facilities in September 2011 (Figure 2-2-21).

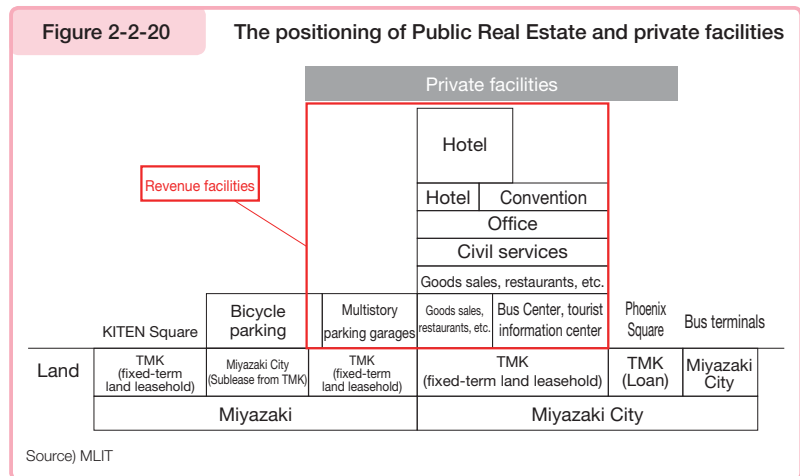


Figure 2-2-21 Satisfaction level of trading and industries (DI value)

Items	FY 2007	FY 2011	Increase and decrease
An attractive town that anybody wants to work	▲38.3	▲30.1	8.2
A town that offers opportunities of starting a new business	▲46.9	▲35.7	11.2
A town with many attractive stores	▲59.2	▲52.8	6.4
An extensive selection of products	▲36.9	▲37.7	▲0.8
An extensive selection of affordable products	▲17.8	▲12.6	5.2
High quality products	▲4.8	▲2.6	2.2
Do not have to worry about business hours	▲33.1	▲31.0	2.1
A town that offers common parking ticket, rental bicycle and temporary childcare.	▲41.0	▲26.9	14.1
A town that people have fun time	▲21.0	▲17.8	3.2
A friendly town that people can stop by casually.	▲5.8	▲4.2	1.6
A town that shop and business owners work together for revitalization.	▲6.0	▲4.8	1.2

(Notes) 1 The satisfaction level (DI value) is divided into five levels including "Satisfied," "Slightly satisfied," "Neither," "Not really satisfied" and "Not satisfied." The response rate was calculated based on the negative and positive degree.
 (The response rate of "Satisfied" x 2 + The response rate of "Slightly satisfied") - (The response rate of "Not really satisfied" + The response rate of "Not satisfied" x 2)
 2 The FY 2011 survey was conducted from February to March 2012.
 Source) Miyazaki City, Miyazaki citizens satisfaction survey

In this case, the prefecture and city also obtain revenues from land rent based on a fixed-term land leasehold from the private sector. By effectively developing unused public real estate, it reduces the public entities' financial burden and leads to the creation of private demand and vitalization of the local district.

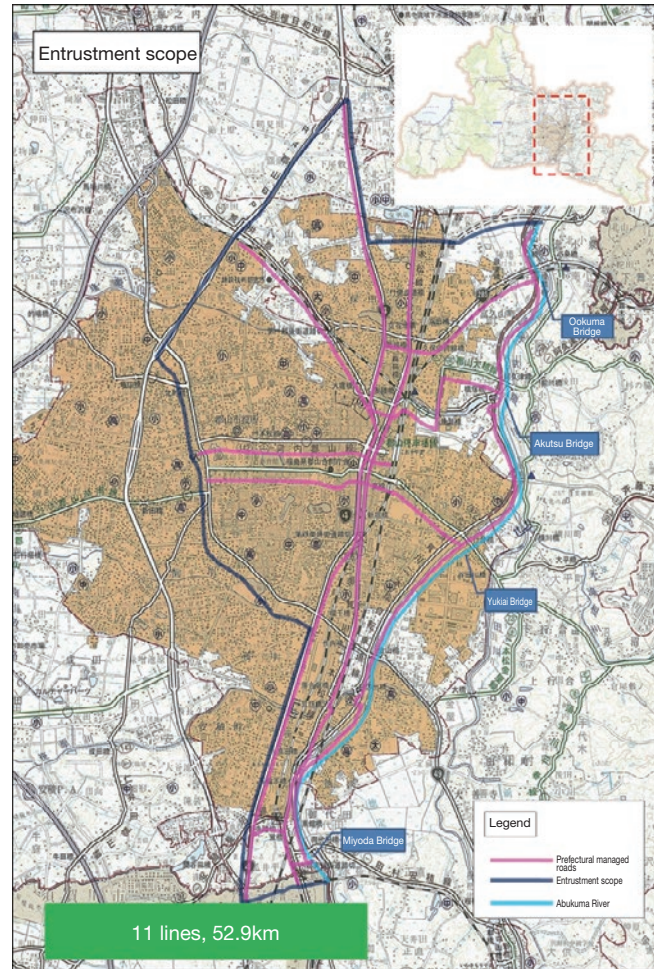
■ The maintenance management of Route 4 and prefectural roads in Fukushima (comprehensive work consignment to private sector)

For the maintenance management of infrastructure, in order to diversify the needs associated with an increase in costs due to aging and population decline in the future, Fukushima was considering it is necessary to improve productivity of maintenance management operation. Also, in April 2016, with the transfer of Route 4 from the government to the prefectural government, they considered the introduction of method that enlarges a public-private partnership such as the response to insufficient staff, effective operation, and the introduction of comprehensive work consignment to private sector.

For the basic policy of the construction of business scheme, the private sector that is in charge of maintenance management receives proper profit and makes for an attractive business by improving the sophistication of the project itself. Another element of the basic policy was to construct and introduce the mechanism that benefits each element of private partnership such as the mitigation of tasks for public workers and the reduction of maintenance management cost. Because of this, the comprehensive entrustment of operations to the private sector was considered. In FY 2016, which is the first year, the contract term is set to a year and for the part of prefectural road that crossed Route 4, they determined that the outsourcing of operations such as road maintenance, patrol, snow removal and other road-related operations in a comprehensive manner (Figure 2-2-22). For the days to come, the operation process and costs are monitored to proceed with the entrustment after the next fiscal year.

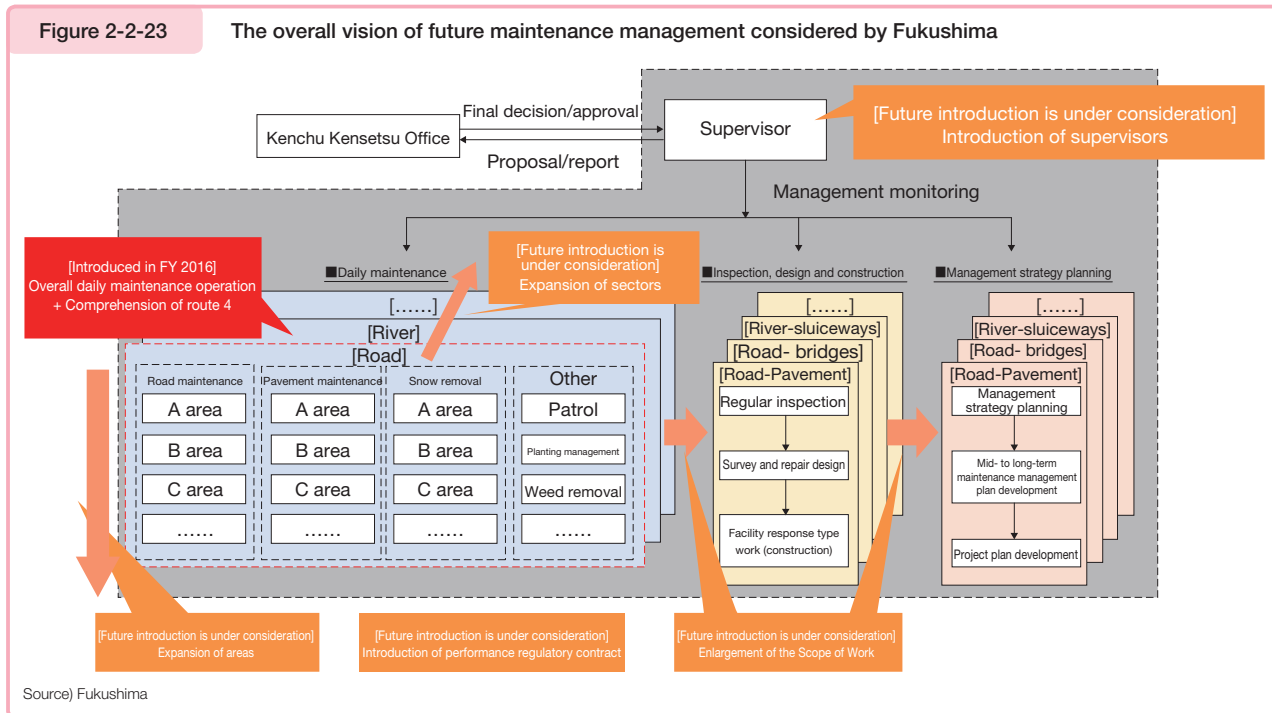
In addition, in the exchange of opinions with private businesses conducted in November 2015, the private sector passed on their opinions about the expansion of area and business scale, as well as the extension of contract term. Fukushima plans on expanding entrusted operations into other sectors besides roads such as rivers, area expansion, and introduction of a contract term to multiple years. Other opinions include the necessity of participation of corporations that are acquainted locally and their desire to establish supervisors that oversee these corporations. In respond to these opinions, Fukushima plans on determining the implementation of trial run of the comprehensive work consignment to private sector in FY 2016 to consider the possibilities of introduction and its effects (Figure 2-2-23).

Figure 2-2-22 The entrustment scope and target lines in FY 2016.



Regular contract method	Project name
Unit price contract	(i) Road maintenance and repair operation
	(ii) Pavement maintenance and repair operation
	(iii) Snow removal operation
	(iv) Anti-freeze agent dispersal operation
Total price contract	(i) Road patrol operation
	(ii) Road plant management
	(iii) Road environment beautification operation
	(iv) Road weed removal operation

Source) Developed by MLIT based on the materials provided by Fukushima



Currently, Japan has a small number of cases that implemented the comprehensive work consignment to private sector in the maintenance management projects. Because of this, there are insufficient operation knowhow and information sharing among local governments. MLIT works with local governments for the maintenance management of Sanjo and Ube, Fukushima, aiming to realize the implementation of comprehensive work consignment to private sector so as to share various challenges and review improvement measures specifically.

As just described, in order to proceed with effective public-private partnership, the public-private partnership dialogue, and the development of scheme for a win-win relationship is essential. With this, the private demand is stimulated to enable the development and operation of infrastructure that utilizes the strength of each public-private partnership.

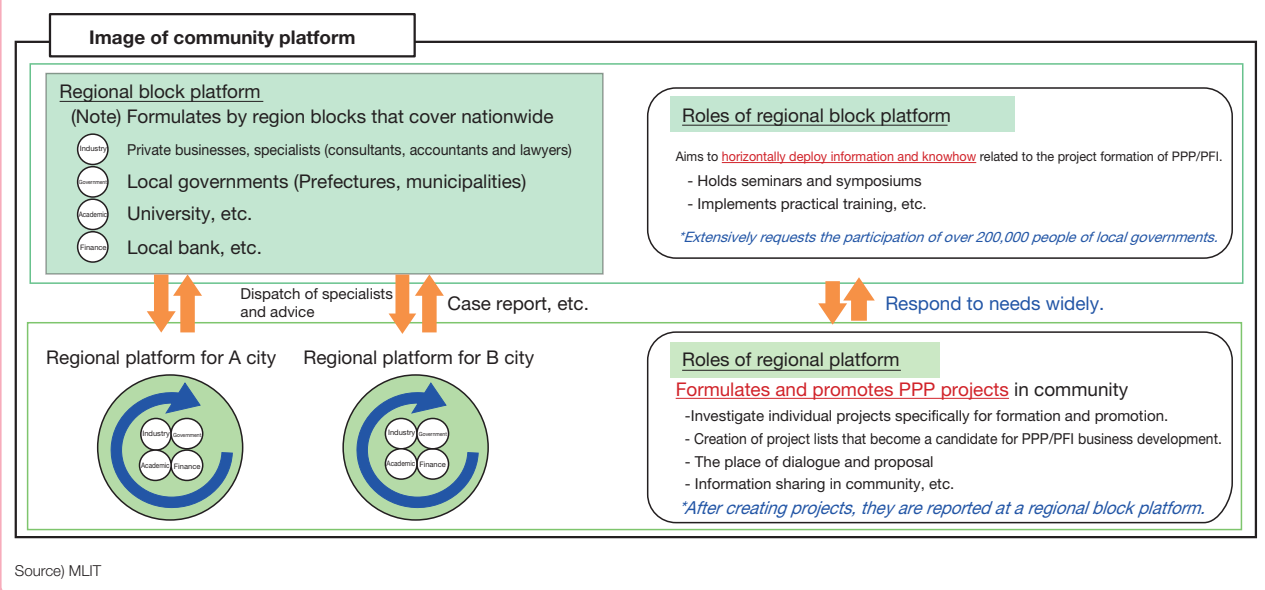
2 The initiatives of the Minister of Land administration for the promotion of PPP/PFI projects

(1) Formation of regional platform

In the Basic Policy on Economic and Fiscal Management and Reform 2015, the government aims to develop and disseminate the PPP/PFI method using the regional platform through industrial-academic-government-financial cooperation for the nationwide implementation of PPP/PFI.

Aiming to share information and knowhow for PPP/PFI of regional public-private MLIT establishes a regional platform as a place of discussion for industrial-academic-government-financial cooperation. In FY 2015, Hokkaido, Tohoku, Kanto, Chubu, Kinki, Chugoku, Shikoku and Kyushu established a core member conference (32 industrial organizations, 153 government organizations, 20 academic organizations and 61 financial organizations) and hold a seminar to introduce preferable cases in six locations (Sendai City, Hiroshima City, Tokyo, Fukuoka City, Osaka City and Nagoya City) (about 1,100 participants). In addition, the government support each local government at their request to form a regional platform to discover and implement specific PPP/PFI projects in order to solve their challenges (Figure 2-2-24).

Figure 2-2-24 Image of community platform



(2) Pioneering PPP support projects

As for the introduction of PPP/PFI, it requires various studies and information maintenance regarding business methods and the division of roles for public-private partnership. Because of this, the MLIT grants the costs related to the research of introduction possibilities for local governments considering the utilization of advanced PPP/PFI method to support the formulation of projects. The contents of support are divided into two support types: the first is the business method consideration support type, which supports research funds for the introduction and implementation of advanced PPP projects for the types of facilities, project scale, patterns, and methods, and the second is information improvement support type, which supports research costs for the maintenance of necessary information to determine the introduction of PPP projects. These are used in the research of Sendai Airport that introduced the concession method and Seien basin sewage works of Hamamatsu-shi that is in progress of this method. For the days to come, the dissemination of the area's PPP/PFI will be advanced as part of the support projects.

Section 3 The Results of Opinion Poll and Analysis of Private Businesses

As described in section 1 of this chapter, the prioritization of investment in businesses with high stock effects is sought after and it is important to have the viewpoint of smart investment and use, which the infrastructure development is utilized to gain benefits by putting in small investment and the existing infrastructure is ingeniously used.

From these viewpoints, as we consider that it is necessary to grasp the needs of private businesses that conduct business activities that actually use infrastructure in order to determine the direction of infrastructure development and utilization for the future, we conducted a survey targeting private businesses across the country.

In this section, to study the awareness on the infrastructure of private businesses, we analyzed the awareness and needs related to the infrastructure development for each industry of private businesses centering on the results of business survey of the MLIT ^{Note 49}, which was implemented in February 2016, with the aim of introducing the awareness of business environment surrounding the private businesses.

Note 49 Implemented in February 2016. The survey targeted 10,000 private businesses by mail. (The number of businesses responded: 2,276)

Business categories surveyed: Agriculture, forestry and fishery, mining, construction business, manufacturing industry, wholesalers, retailers, restaurants and lodging industries, medical, public welfare, transportation and communication industries. Infrastructures surveyed: Expressways, general roads, high-speed railways (Shinkansen, express trains), airports (including air transport), ports and harbors (including marine transportation), levees, dams, local public transportation (bus, tram, local lines, subway, etc.) and others (sewage works, parks, etc.)

1 General theory: Diverse types of awareness among private businesses

Speaking of private businesses, depending on the difference of business category, facility function, business scale, and location, there should be a variety of needs and awareness toward the infrastructure of private businesses such as the business activity process, strategies for maintaining and growing business and business activities.

In order to prioritize the investment to businesses with high stock effects, as well as to induce private demand, it is important to strengthen the cooperation with private businesses. Although it is not realistic to consider and reflect all of the diverse needs for private businesses that are analyzed and introduced in this section, the key is to make an adjustment of priority and time axes with our eyes set on maximizing the stock effect by which the supplier understands that there are various needs among consumers.

(1) The importance of infrastructure by business category and facilities

We surveyed the difference in infrastructure needs for each business category and facility. The following casually introduces distinguishing results (Figure 2-3-1).

(Roads)

The results show that the importance of roads is the highest in all industries. In particular, the business categories that are assumed to move products and materials in a broad area show a high degree of importance in mining, construction business, manufacturing industry, wholesale, retail, transportation, and communication.

(Local public transportation)

The results showed that there are high needs in the tertiary industry, which is the service industry (restaurant and lodging industry, medical and public welfare).

(Levee/Dam)

The results showed that the importance in the agriculture, forestry and fishery is nearly twice higher than in other industries.

(Ports and harbors)

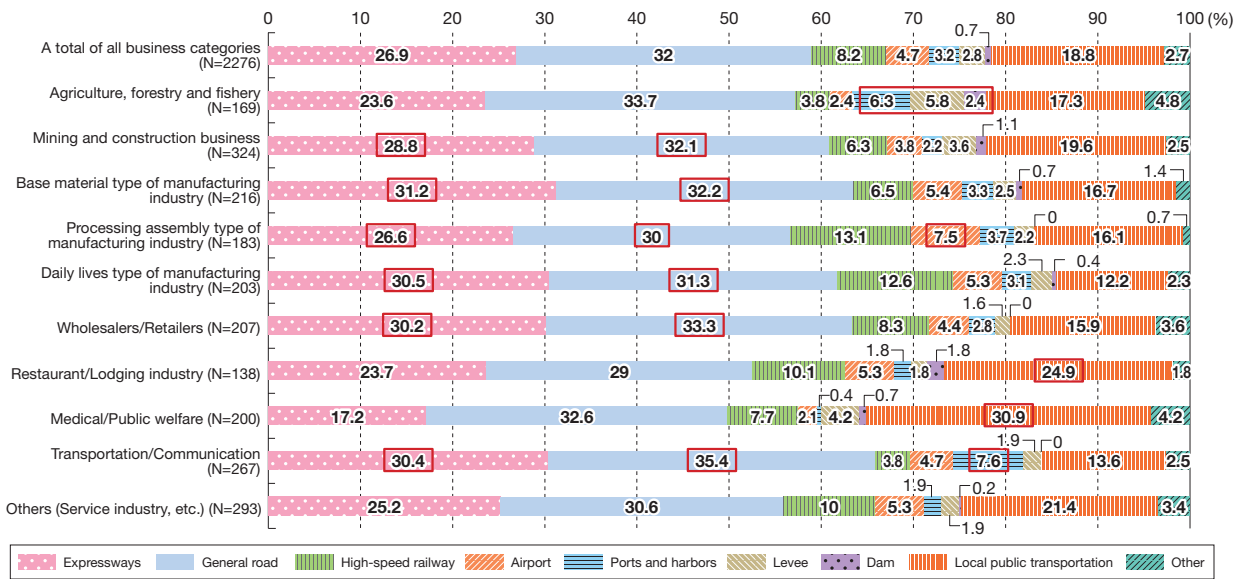
The results showed that the importance in the transportation, communication, agriculture, forestry, and fishery is higher. The transportation and communication are the industries that indicate the highest importance for ports, harbors, and roads.

(Airports)

The processing and assembly industries/Manufacturing industry showed a higher importance than other industries. The unit price per weight of products and low general-purpose properties might also affect the results.

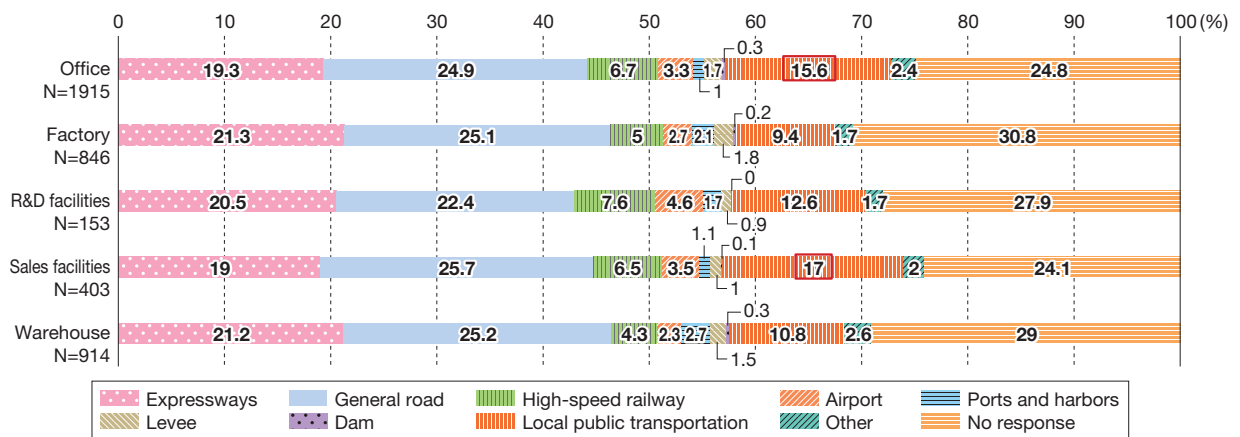
In addition, while the difference of facilities (such as office, plant, research and development center, shops and warehouse) did not indicate major distinction and the office, sales facilities show a higher need for local public transportation (Figure 2-3-2).

Figure 2-3-1 The importance of infrastructures by business categories



(Notes) 1 Analysis was done excluding No response.
 2 The comparison of the total number of infrastructures (top three) that are thought to be important for business activities in each industry.
 3 A total of all business categories includes 76 businesses that could not be categorized.
 Source) Business Survey by MLIT

Figure 2-3-2 The importance of infrastructures by facilities



(Note) The comparison of the total number of infrastructures (top three) that are thought to be important for each facility.
 Source) Business Survey by MLIT

(2) Other distinctive consciousness

The businesses survey by MLIT offered separate individual interviews to contractors (implemented in 2015) and the willingness to invest in infrastructures in accordance with the business plan (promotion early development by bearing development costs partially) and the will for contributing the regional disaster prevention by offering the company's own facilities at the time of disaster (offering the rooftop facilities as an evacuation site at the time of floods, etc.), showing diverse types of awareness.

(3) Satisfactory survey

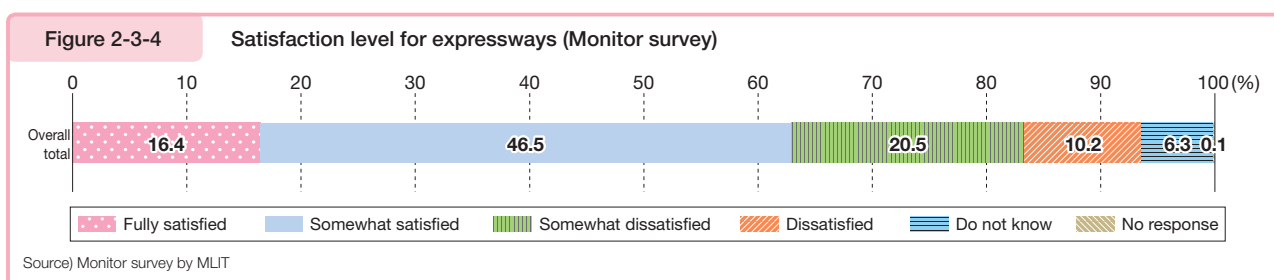
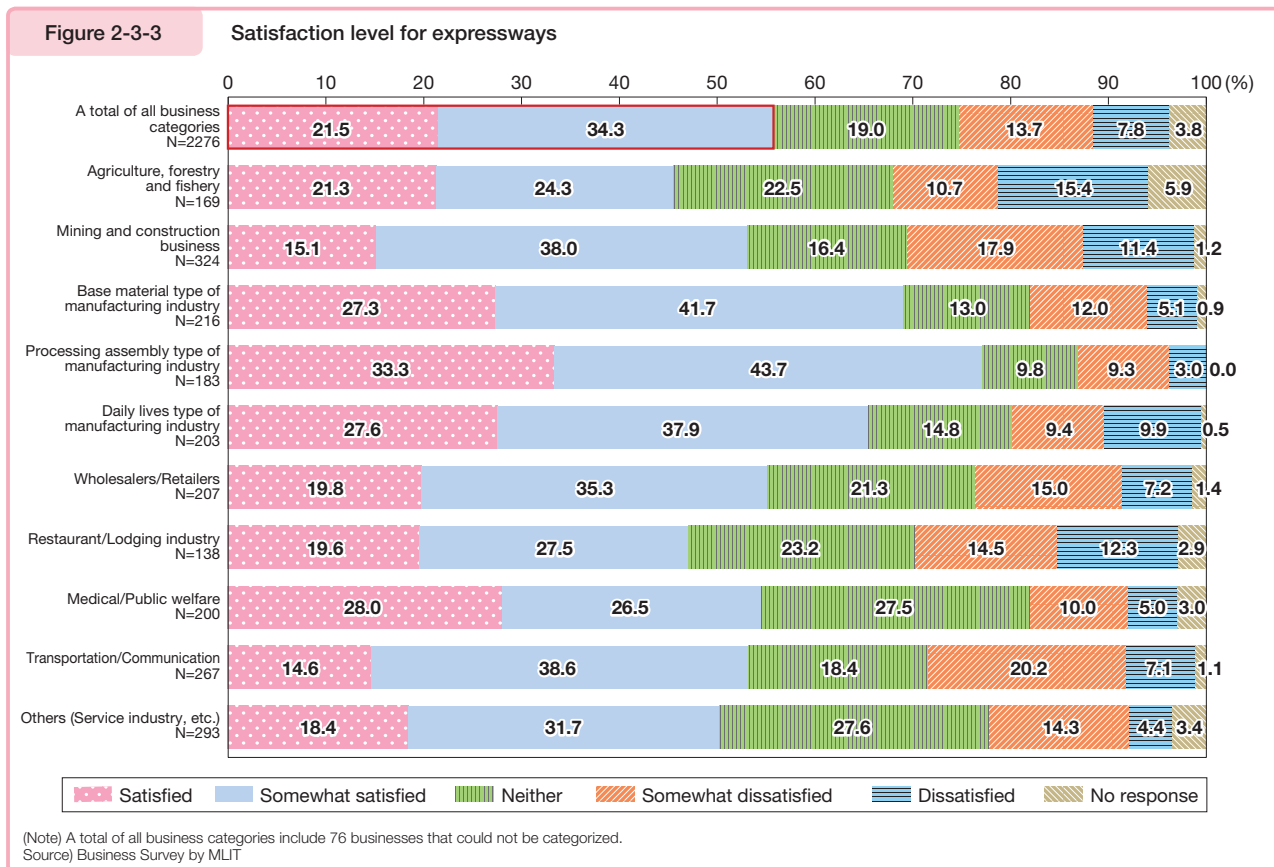
We surveyed a satisfaction level of each infrastructure. While the results vary by the subjective views of businesses, the location of businesses and the characteristics of business categories, we introduce some of the distinctive results just as a reference.

(Expressways)

Expressways are the only infrastructure that the total of “Satisfied” and “Somewhat satisfied” accounts for over 50% among the entire business categories, and a certain satisfaction level was confirmed (Figure 2-3-3).

By business categories, the total of “Satisfied” and “Somewhat satisfied” accounts for over 50% in most of the business categories. In particular, the satisfaction level of the manufacturing industry reaches over 70%. However, the agriculture, forestry and fishery and restaurant/the lodging industry went below 50%.

Also for the monitor survey ^{Note 50}, we saw a relatively high satisfaction level (Figure 2-3-4).



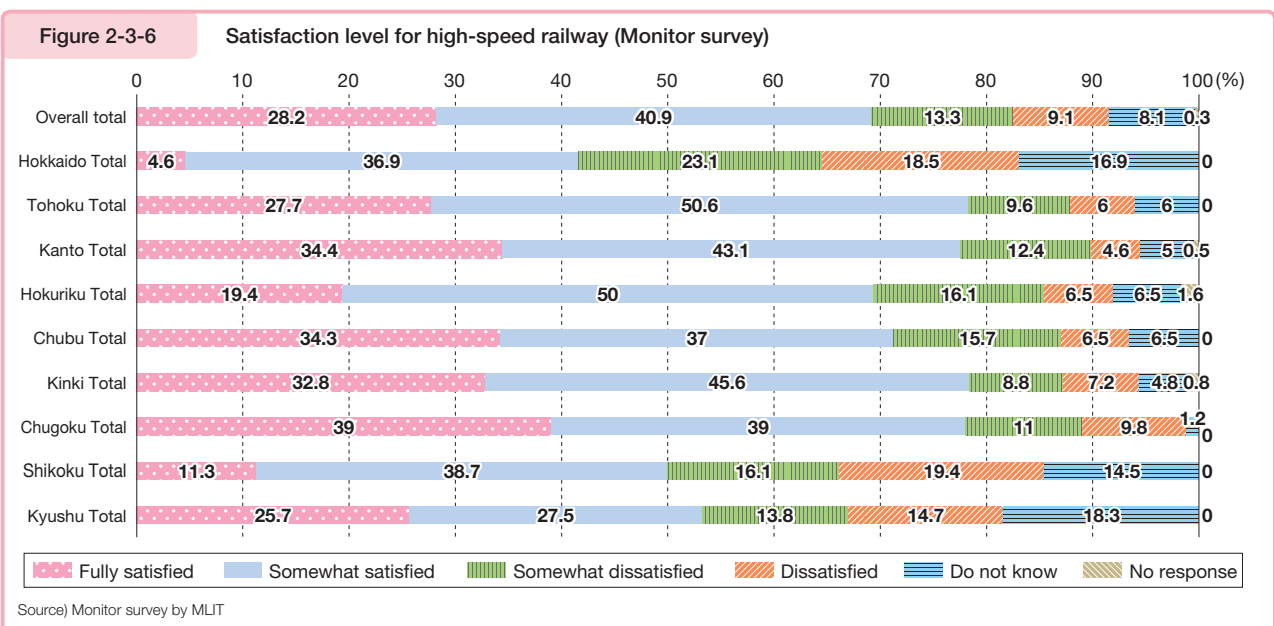
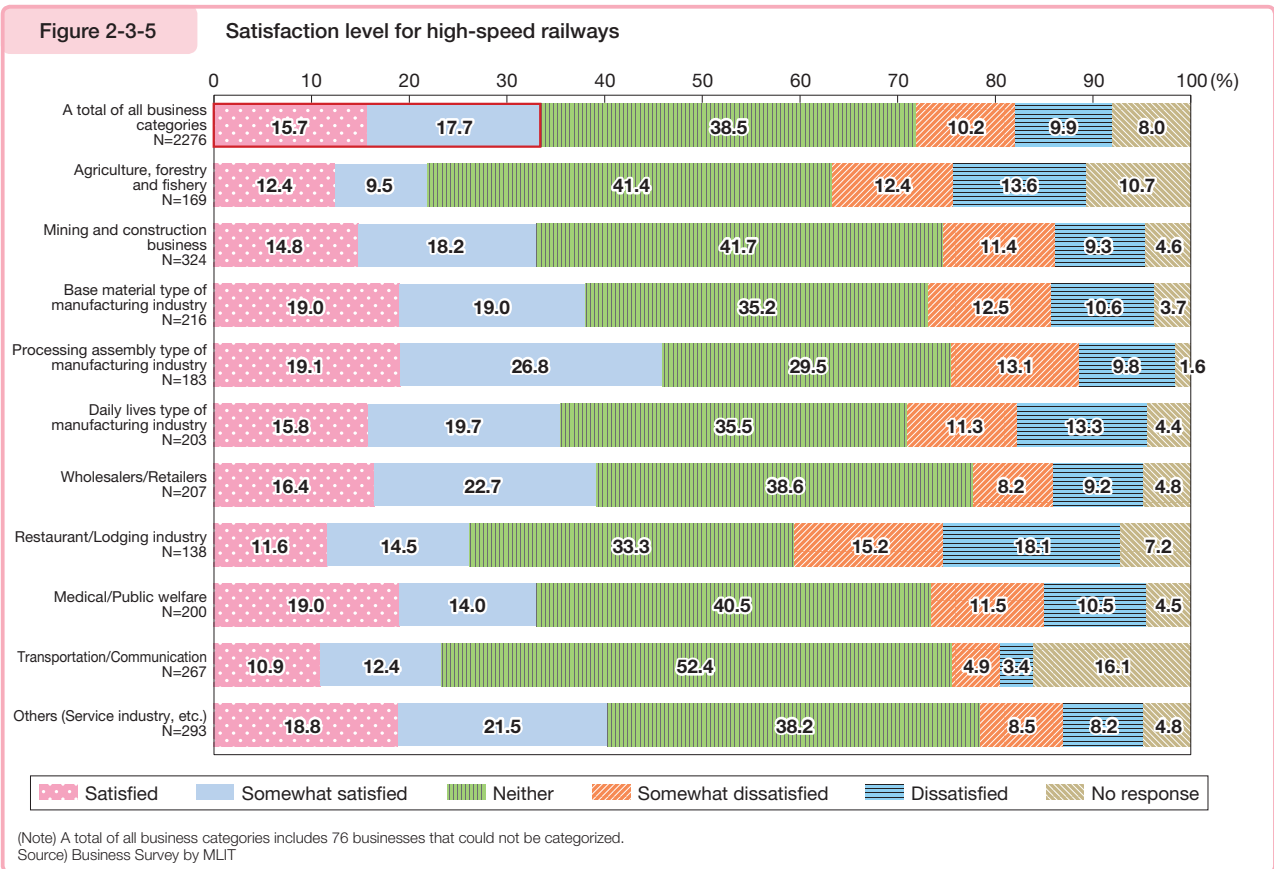
(High-speed railway)

The total of “Satisfied” and “Somewhat satisfied” accounts for just below 40%, which we confirmed a certain level of satisfaction followed by the expressways. By business categories, the mining, construction business, manufacturing industry, wholesale and retail industries showed a relatively high satisfaction. On the other hand, agriculture, forestry and fishery, restaurants, lodging industry, transportation and communication industry showed lower satisfaction (Figure 2-3-5).

Note 50 The survey, titled the awareness survey on infrastructures and infrastructure development, was conducted targeting 1,098 male and female aged 20 years and older living across the country during the period of Monday, February 8, 2016 to Monday, February 22, 2016. The numbers of response were 914 (Male: 484, Female: 430).

Although it is not necessarily appropriate, the results suggest there are possibilities that the size of business activity area has an impact. It leaves an impression that the business categories that seem to have a relatively high use frequency among business activities have a high satisfaction and there might be a correlation between use frequency and satisfaction level.

On the other hand, the satisfaction level reached about 70% in the monitor survey and there is the major difference of the satisfaction level between business and private use. In addition, the results of monitor survey have major regional difference and as of the survey, the areas without Shinkansen railways showed a low percentage in Hokkaido, Shikoku and a part of Kyushu (Figure 2-3-6). After the opening of Hokkaido Shinkansen in March 2016, we expect that the satisfaction level will increase in Hokkaido.

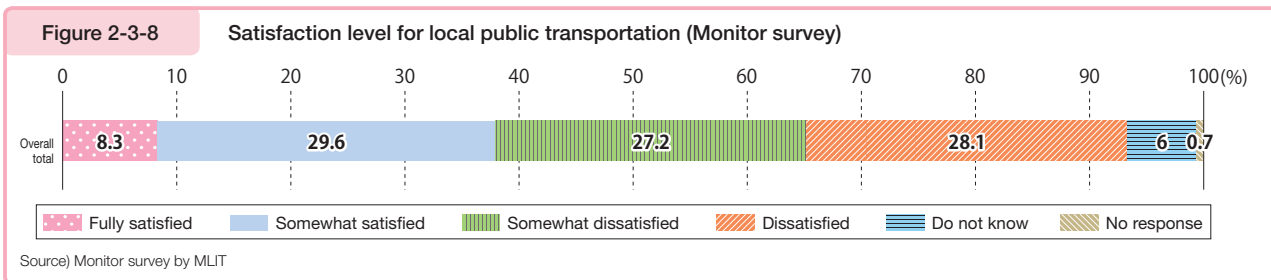
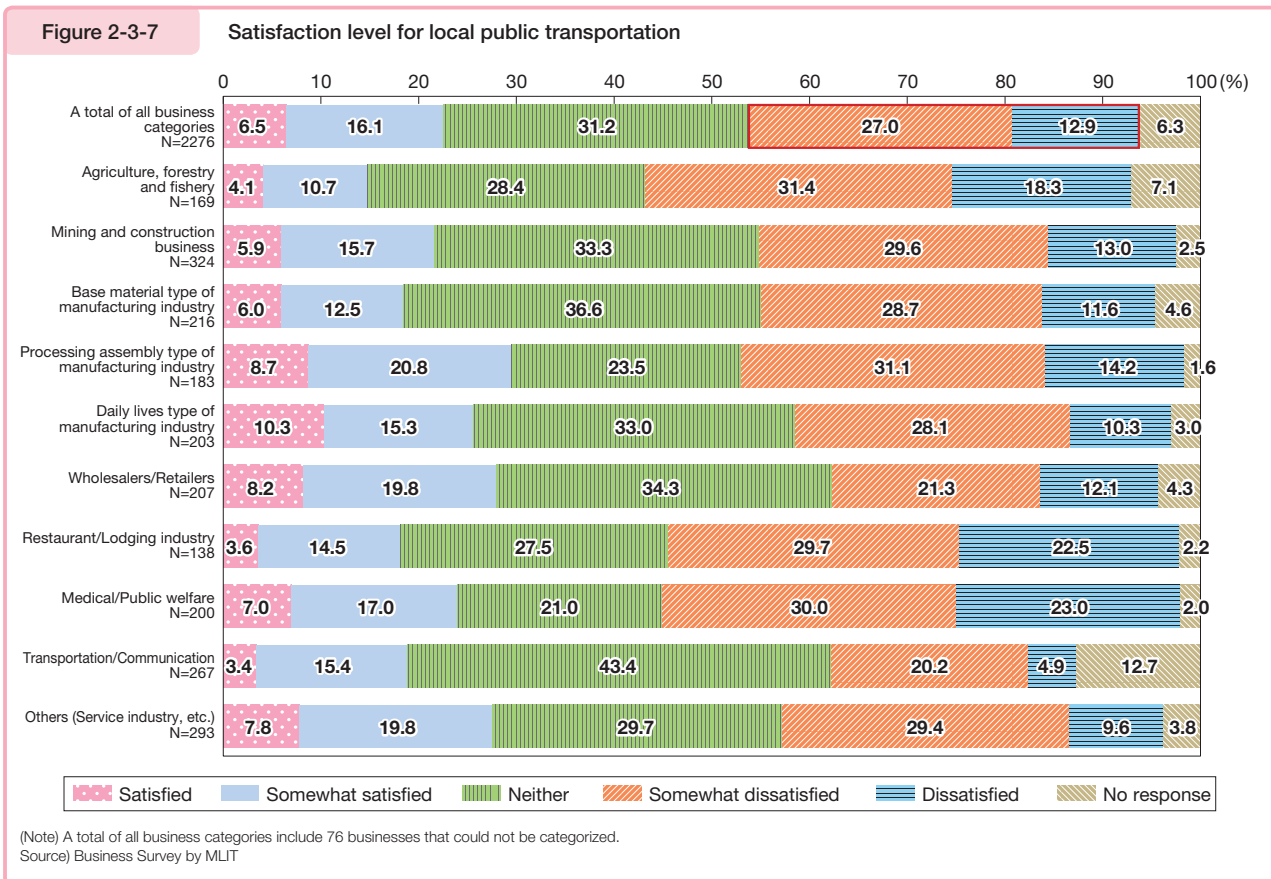


(Local public transportation)

Compared to other infrastructure, the results showed that the dissatisfaction level is the highest (Figure 2-3-7).

We can assume that this is because it relates to daily living more closely than other infrastructure and people are likely to feel convenience and the level of demand is high. Although people are also familiar with the general roads (it was followed by the local public transportation), it is possible that there is gap with local public transportation because services are not involved with the general roads.

The results of monitor survey also showed that the dissatisfaction level is high (Figure 2-3-8).



2 Each theory: Consciousness toward the infrastructure of private businesses for each policy issue

(1) The productivity of tertiary industry

As described in Section 1, Chapter 1, Japan has been seeing an increasing proportion of tertiary industries due to the changes of industrial structure after the war to present year by year. In recent years, while the ratio of tertiary industry for all industries exceeds 70%, the productivity of Japan’s tertiary industry is considered low. The improvement of productivity for the tertiary industry is a major issue in order to achieve Japan’s economic growth.

In this section, as the tertiary industry, the retail industry, restaurants, medical and public welfare industries are used for analysis.

(Consciousness toward the improvement of productivity in tertiary industry)

First, we checked what businesses expect from infrastructure for the improvement of productivity in all business categories (Figure 2-3-9). Next, by comparing their expectation in tertiary industry and other business categories, we confirmed gap in both cases.

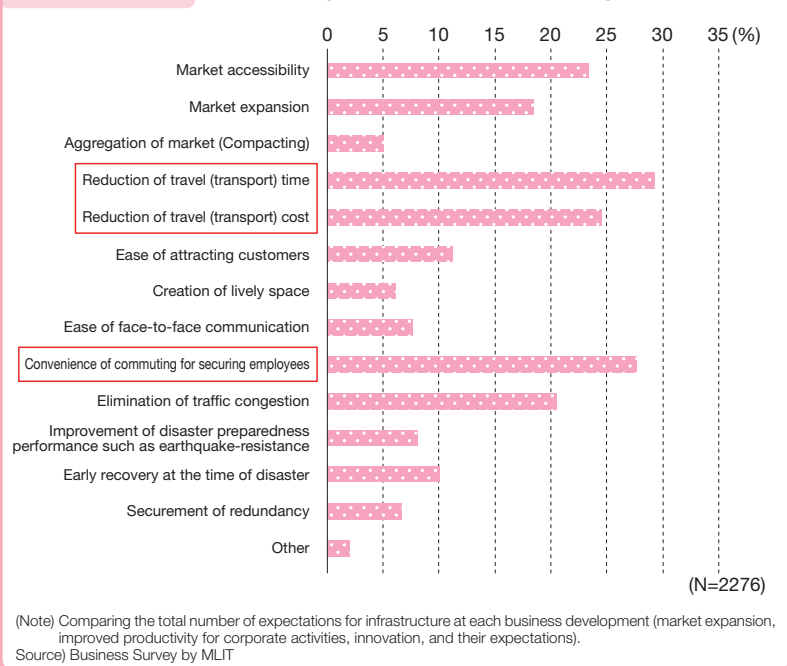
For all business categories, people have high expectation on the traveling (transport) time and cost reduction, followed by the convenience of commuting in order to secure employees. On the other hand, the tertiary industry is often B to C (Business to Customer), which is the business for individual customers, and has a higher interest in the item related to attracting customers. Because of the characteristic of B to C business, this result is obvious. However, let us look at the item of “the aggregation of market (compacting)”. When comparing the tertiary industry with other business categories, while we could not confirm the difference that directly leads to attract customers, such as “the ease of attracting customers” and “the creation of lively space”, the results showed that “the productivity improvement by market” is high (approx. 6.0% for the tertiary industry and approx. 4.9% for other industries than the tertiary industry: approx. 5.0% of the average of all business categories) (Figure 2-3-10).

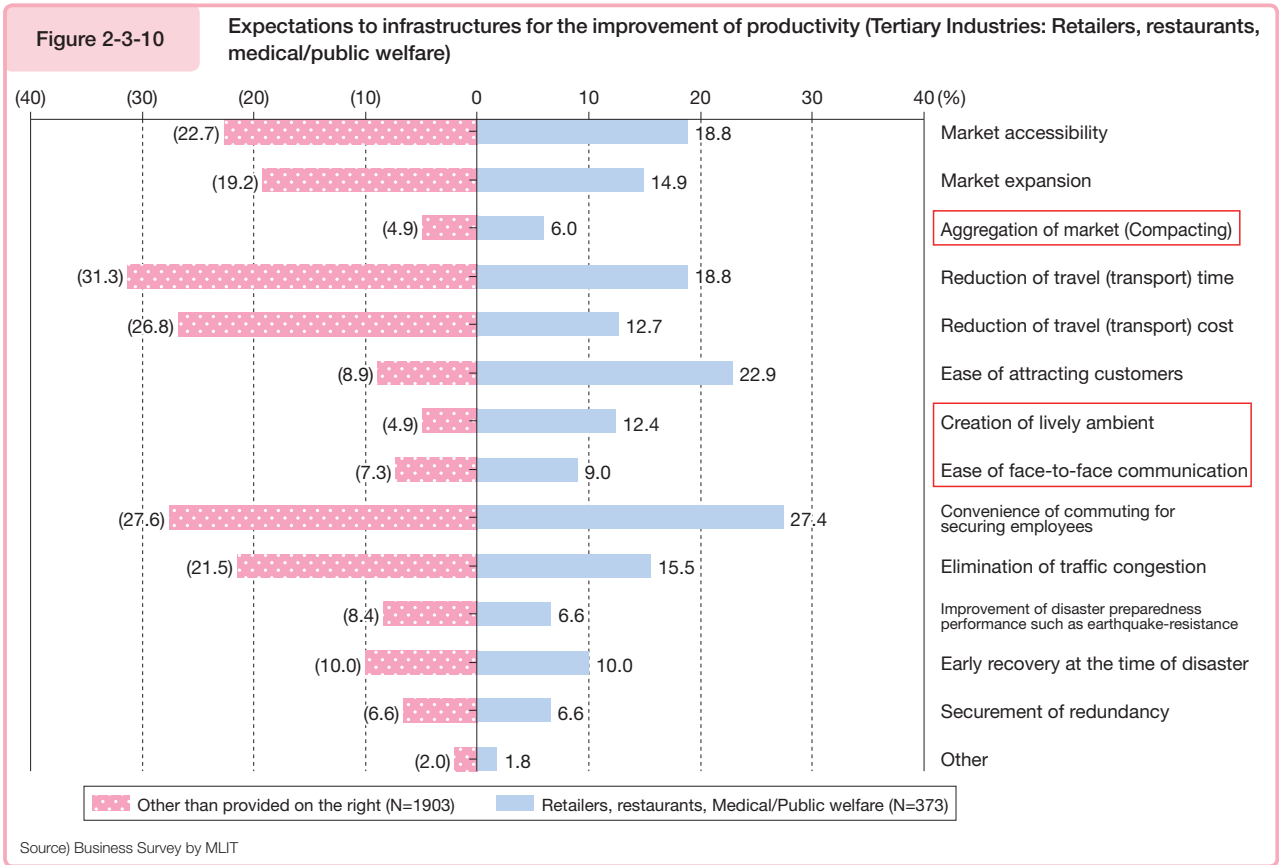
This is perhaps seem to be the orientation leading to “compacting and network”. We expect to see the possibility that the direction of future community development in Japan that is faced with population decline, and the direction of improving productivity in private business will match.

At present, although the gap is small, if the awareness of “the aggregation of market leads to the improvement of productivity” spreads within the tertiary industry in relating to the expectation toward infrastructure, it is possible that the gap will become more significant with other industries in the future.

Figure 2-3-9

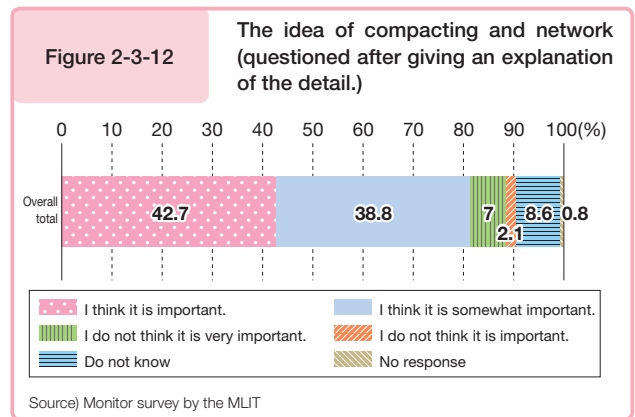
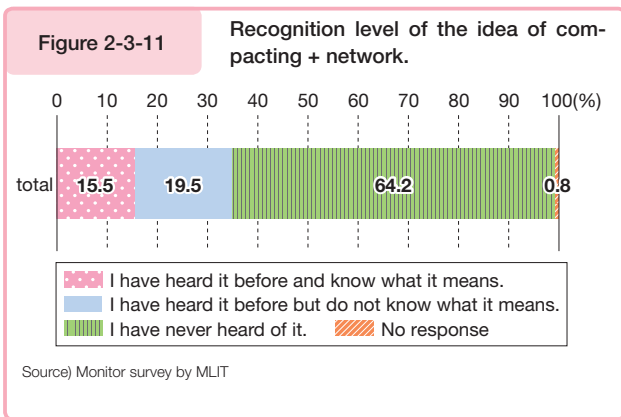
Expectations on infrastructures for the improvement of productivity (A total of all business categories)





Here, let us introduce the results of awareness survey by monitor survey about the compacting and network. While the recognition level is low, when asked about the importance after showing the detail, a large percentage of people said it is important (Figure 2-3-11 and 2-3-12).

These results indicate the necessity of activity for understanding the importance of community development that is suitable for the time by spreading the idea of compacting and network.

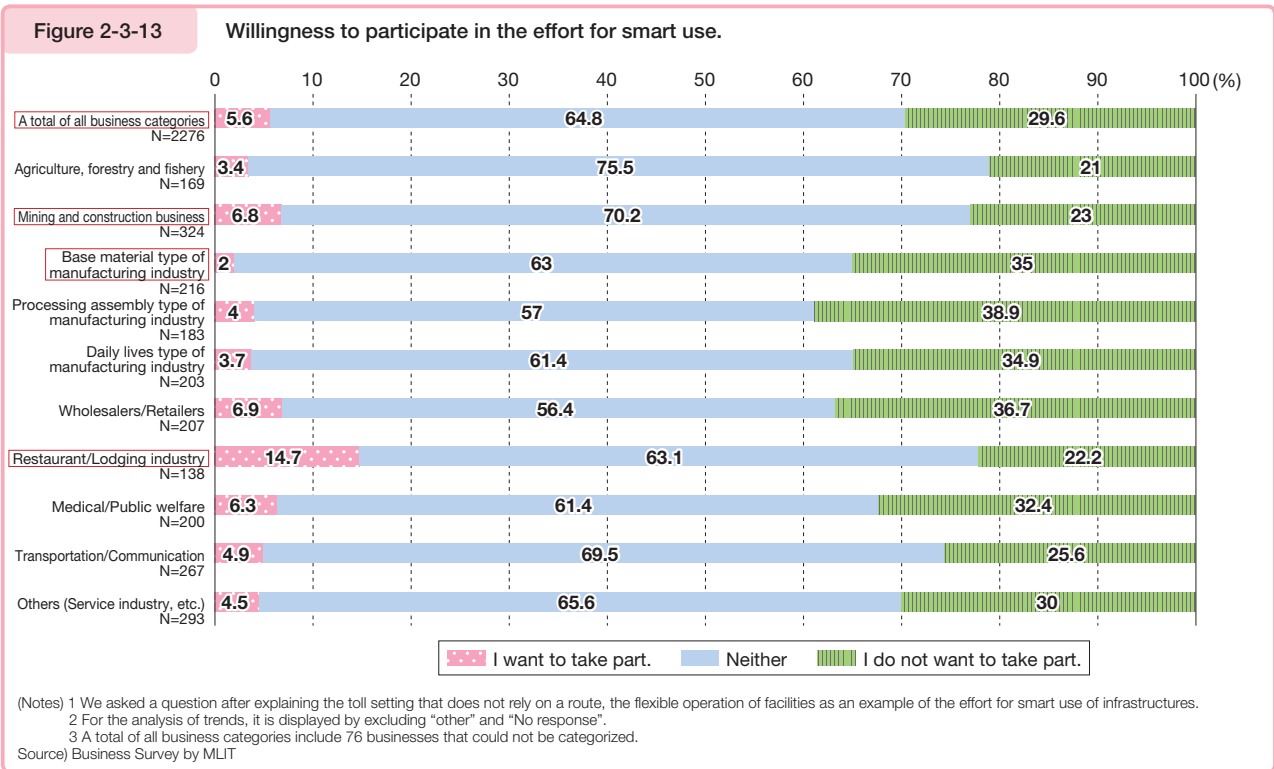


(2) Willingness to show ideas for the effort of smart use

As we consider that the private businesses using the infrastructure (infrastructure users) possibly have various opinions and ideas toward the ingenuity of operating facilities (smart use), we surveyed their willingness to show ideas for the effort for smart use.

Overall, the businesses who answered they wanted to participate fell below 5%. However, the results show that the restaurants and lodging industry prominently account for a large portion (approx. 15%) and the base material type manufacturing industry accounts for extremely small (approx. 2%) (Figure 2-3-13). When looked at more detailed business categories, the lodging industry accounts for over 20% and we can see that there is willingness to differentiate by the efficiency of business activities and the improvement of services by utilizing existing facilities.

Besides the analysis for each business category, it is necessary to notice the level of willingness to participate as a whole. One of the reasons (low willingness) is that they are not familiar with such an effort in the question and some people might feel that they take infrastructure as given. It is desirable that the response of “Neither” that occupies nearly 65% this time will change to “Want to participate.” To do this, it is necessary to introduce stock effects that the smart use of infrastructure increases productivity in an easy-to-understand manner and continue effort to encourage people to understand that the infrastructure relates closely to their own corporate activities and make it a target for taking part in the utilization.



(3) Consciousness of bearers in logistic industry (Transport and communication industries)

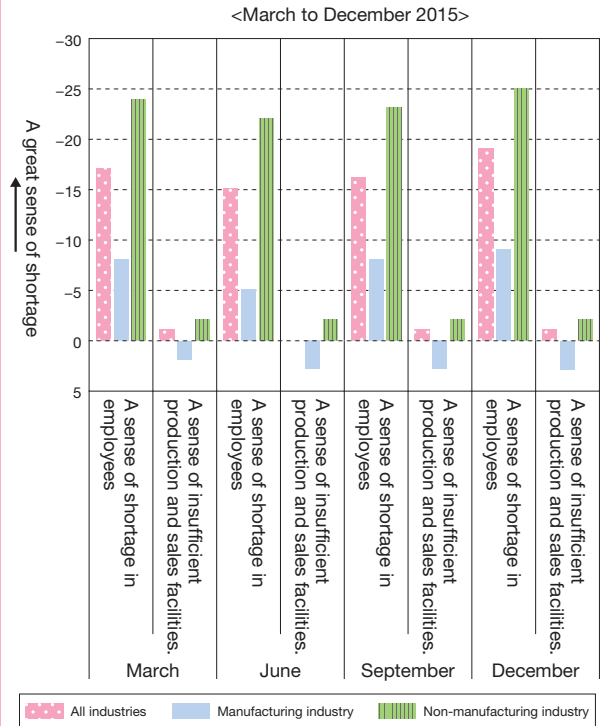
(Situation of labor shortage)

In order to make a survey of the current situation of labor shortage in private businesses, with reference to the DI of the Short-term Economic Survey of Enterprises in Japan (Tankan) by the Bank of Japan ^{Note 51}, it indicates the shortage of personnel is larger than the shortage of facilities (Figure 2-3-14). What is more, according to the results of other survey, we can confirm that the medium-sized enterprises (Below ¥1 billion of capital) especially in non-manufacturing industry experience a major shortage of labor (Figure 2-3-14, 2-3-15, and 2-3-16).

The Business survey by MLIT showed that for the question whether or not they attach weight on the countermeasures of logistic efficiency, many contactors answered the countermeasures for labor shortage. Generally, the above results were obtained in all industries, although with little difference, securing human resources has been an issue for private businesses. In particular, the survey on the transportation and communication industries indicates more marked results. Next, there were opinions that the improvement of working condition is viewed as a problem, shedding light on a sense of insecurity toward the securement of bearers (Figure 2-3-17).

Figure 2-3-14

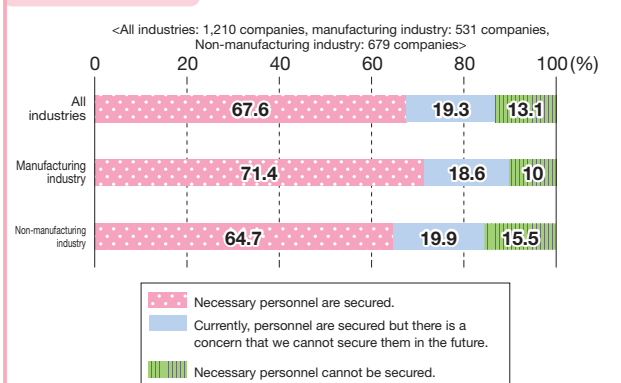
A sense of shortage in employees and insufficient production and sales facilities.



Source) Developed by MLIT based on the website of Bank of Japan.

Figure 2-3-15

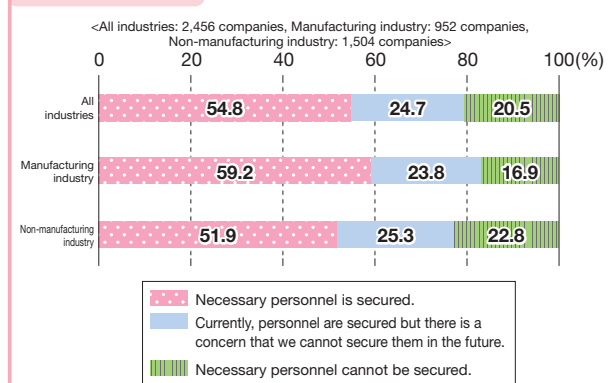
The status of securing temporary and immediate personnel (major corporations over one billion yen of capital)



Source) Developed by MLIT based on the website of Development Bank of Japan Inc.

Figure 2-3-16

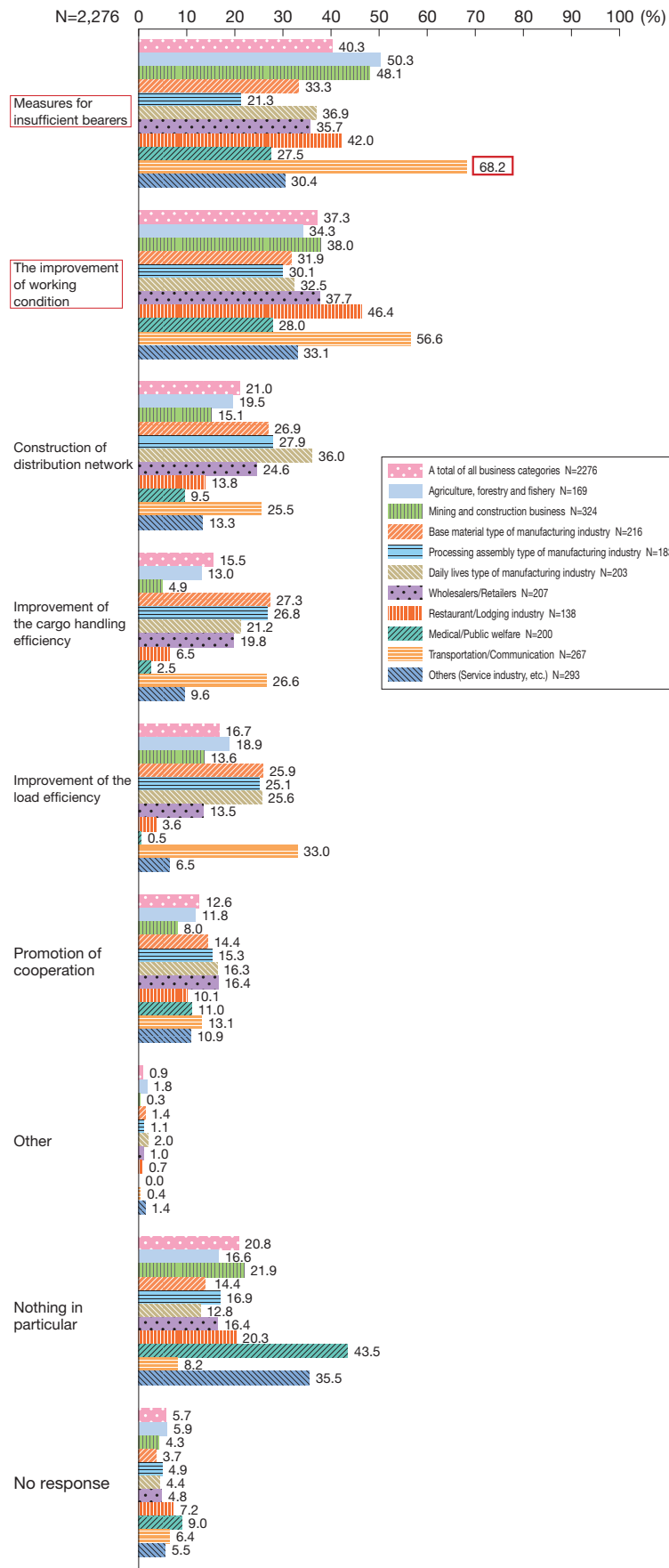
The status of securing temporary and immediate personnel (medium-sized corporations below one billion yen of capital)



Source) Developed by MLIT based on the website of Development Bank of Japan Inc.

Note 51 It is an abbreviated name of Diffusion Index, which is an indexation of various determination elements such as corporations' business condition and the excess and deficiency of facilities and employees.

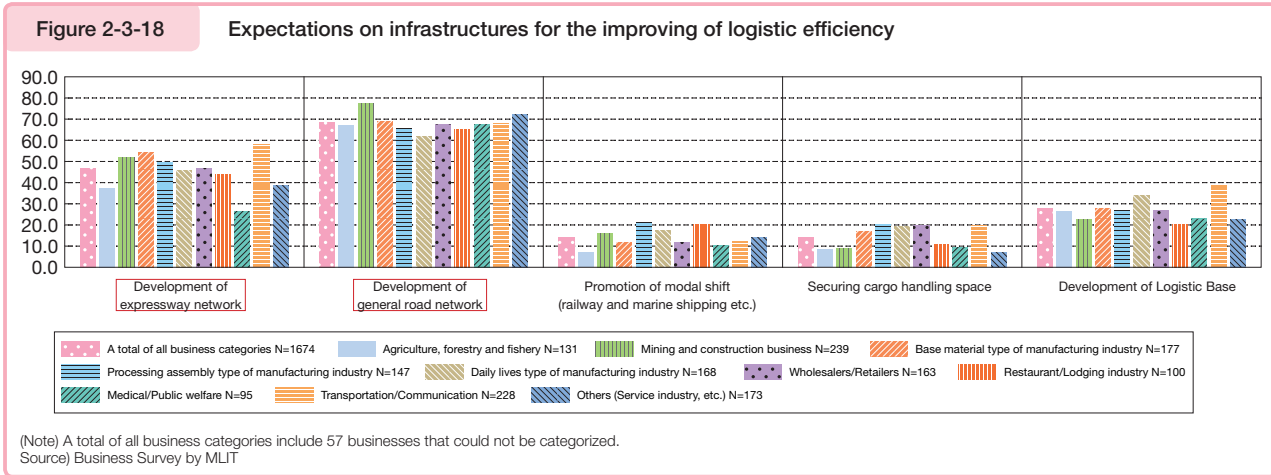
Figure 2-3-17 What they place emphasis on measures for the streamlining logistics.



Source) Business Survey by MLIT

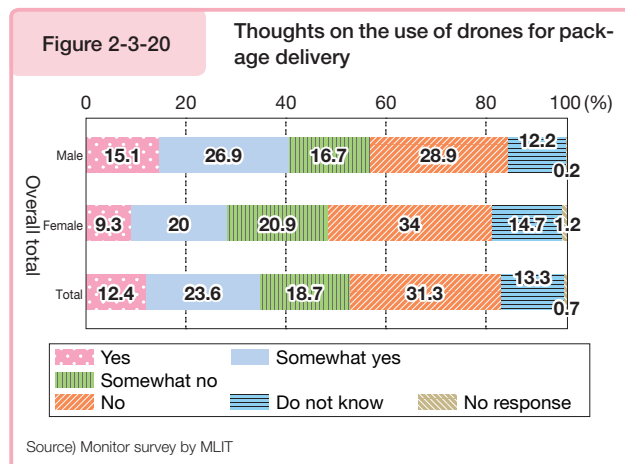
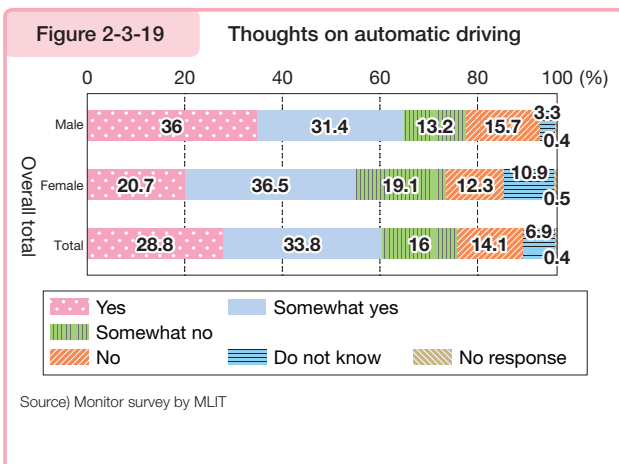
■ Future development

In order to achieve logistic efficiency, when we surveyed what people expect from infrastructure, the development of regional road network (about 69%) and the maintenance of expressways (about 47%) topped the list, indicating their desire to further enhance the road network (Figure 2-3-18).



On the other hand, of the transport and communication industries, the issue of the shortage of bearers especially in the logistic industry causes a number of problems to be solved in soft aspects such as a decline of truck loading ratio, occurrence of waiting time, unnecessary redelivery of package delivery services and the improvement of working condition. For that reason, with the cooperation of various parties concerned from cargo owners to logistic companies, these problems can be solved to make logistics efficient and sophisticated. It is also necessary to lead to efficient use of the existing transportation and logistics infrastructure. In addition, the introduction of new technologies such as the automatic operation, automatic platoon running of trucks, low floor flat car for railway transportation and package delivery using drones, which are currently under development and determination, are considered effective measures.

In addition, to introduce the results of monitor survey for reference, over 60% answered they want to use the automatic driving and over 30% answered they want to use a package delivery service by drones (including “somewhat want to use”) (Figure 2-3-19 and 2-3-20).



(4) Creation of new businesses and services (Innovation)
(Necessity of innovation)

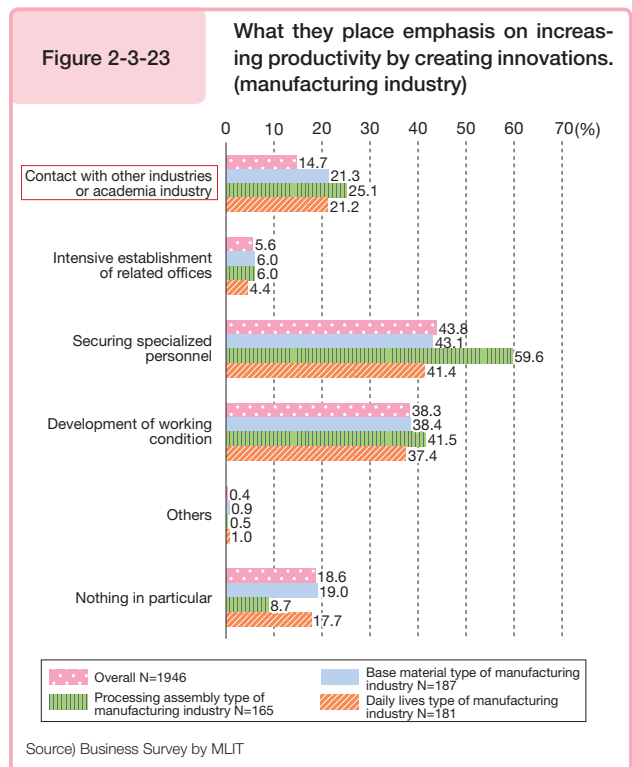
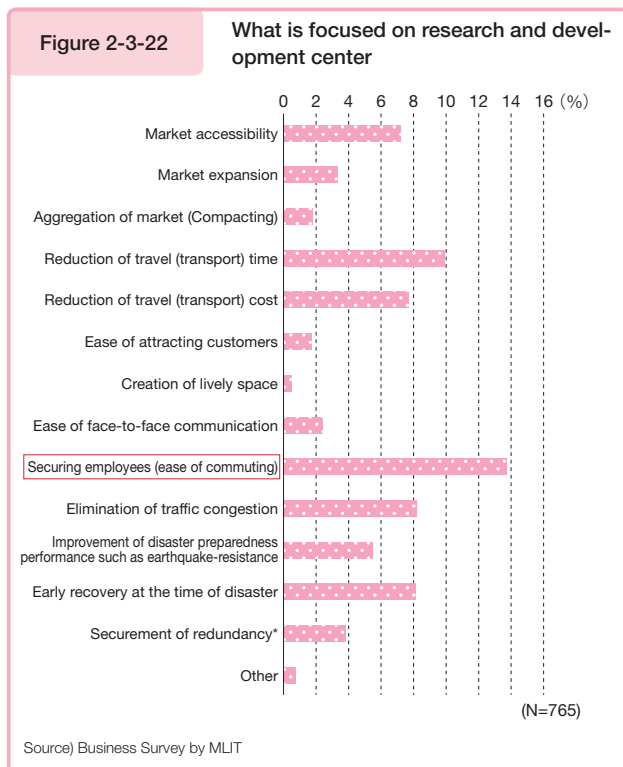
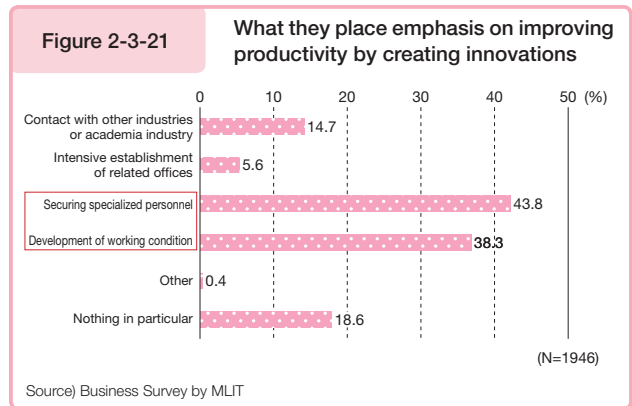
While there are various definitions of innovation, the definitions do not limit to simply technological innovation and a new approach that gives impact to the economy and society.

Based on these definitions, it is not only the manufacturing industry, but also necessary approaches in all industries. While Japan has a tendency of population decline, the reduction of demand associated with population decline is a major problem. With the innovation, it is extremely important to create new services and values in order to increase the demand.

What are the efforts taken by businesses to create innovation? The following introduces survey results.

(Consciousness toward the securement of advanced human resources)

The results of business survey by MLIT indicate that the businesses place the most importance on the securement of human resources (the securement of specialized personnel and improvement of working condition) for the creation of innovation. This indicates that they have a strong awareness of securing advanced human resources that become the source of innovation (Figure 2-3-21).

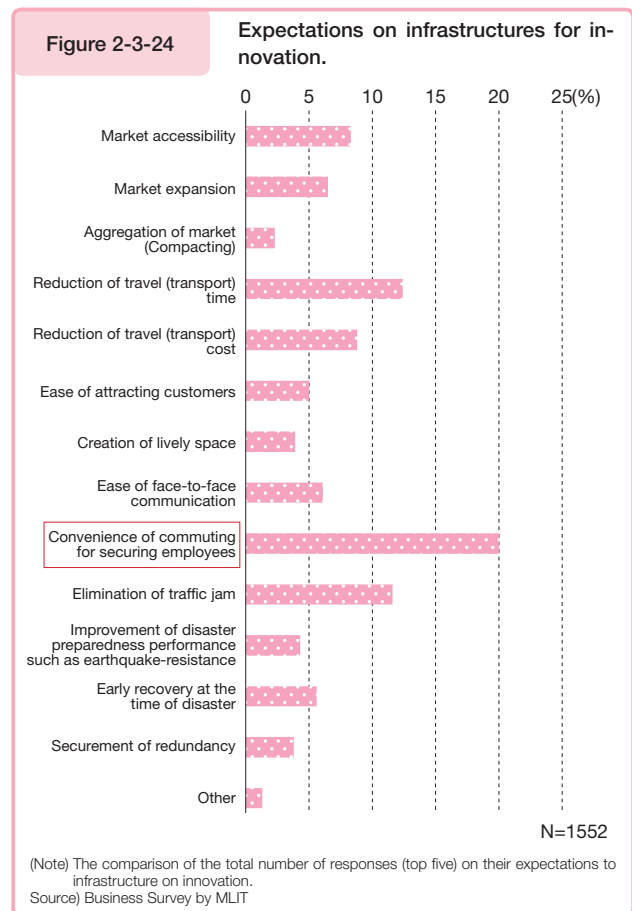


In addition, although the innovation is not equal to research and development, when we conducted a survey by focusing attention on the research and development that operate as part of innovation, the securement of human resources is one of the top reasons for considering the location of a research and development center after all. This also indicates the awareness of private businesses toward the securement of advanced human resources (Figure 2-3-22).

Also, “the exposure with other industries or academia” account for 14.7% of the overall business categories, which did not show a high level of awareness. However, the analysis of the same item by narrowing down in the manufacturing industry indicates that the percentage is over 20%. In the manufacturing industry, it was confirmed that they have a greater consideration on “the importance of communication with other companies” though it is smaller compared to other industries (Figure 2-3-23).

(What is expected to the infrastructure for the improvement of productivity by innovation)

As for the innovation, the results show that “the convenience of commuting for securing employees” is higher than “reduction of traveling time” and “reduction of traveling cost” for what they expect to infrastructure. This suggests that in order to produce new products and services, they are sharply conscious of securing human resources (Figure 2-3-24).

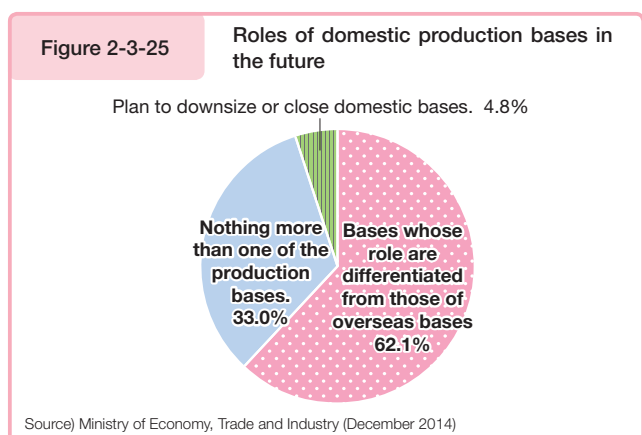


(Example of an approach by a large enterprise)

■ The domestic bases are mother plants and innovation base

The 2015 White Paper on the manufacturing industries by the Ministry of Economy, Trade and Industry also reports that they consider domestic facilities as a base to differentiate with overseas bases (mother plants and innovation base) (Figure 2-3-25).

The results of interviewing the major cosmetic manufacturer, which decided to make a capital investment (the construction of research center and factory) domestically, indicate the following awareness and various types of awareness toward innovation base and mother plants.



- An emphasis on the accessibility of location site with lively space and surrounding environment (research center)
- In consideration with traveling abroad, an emphasis is placed on the accessibility to airport (research center)
- In addition to the function as a mother plant, Locating Plant together with the logistics facilities makes possible to dramatically reduce the number of days when shipping to stores. (Plant)

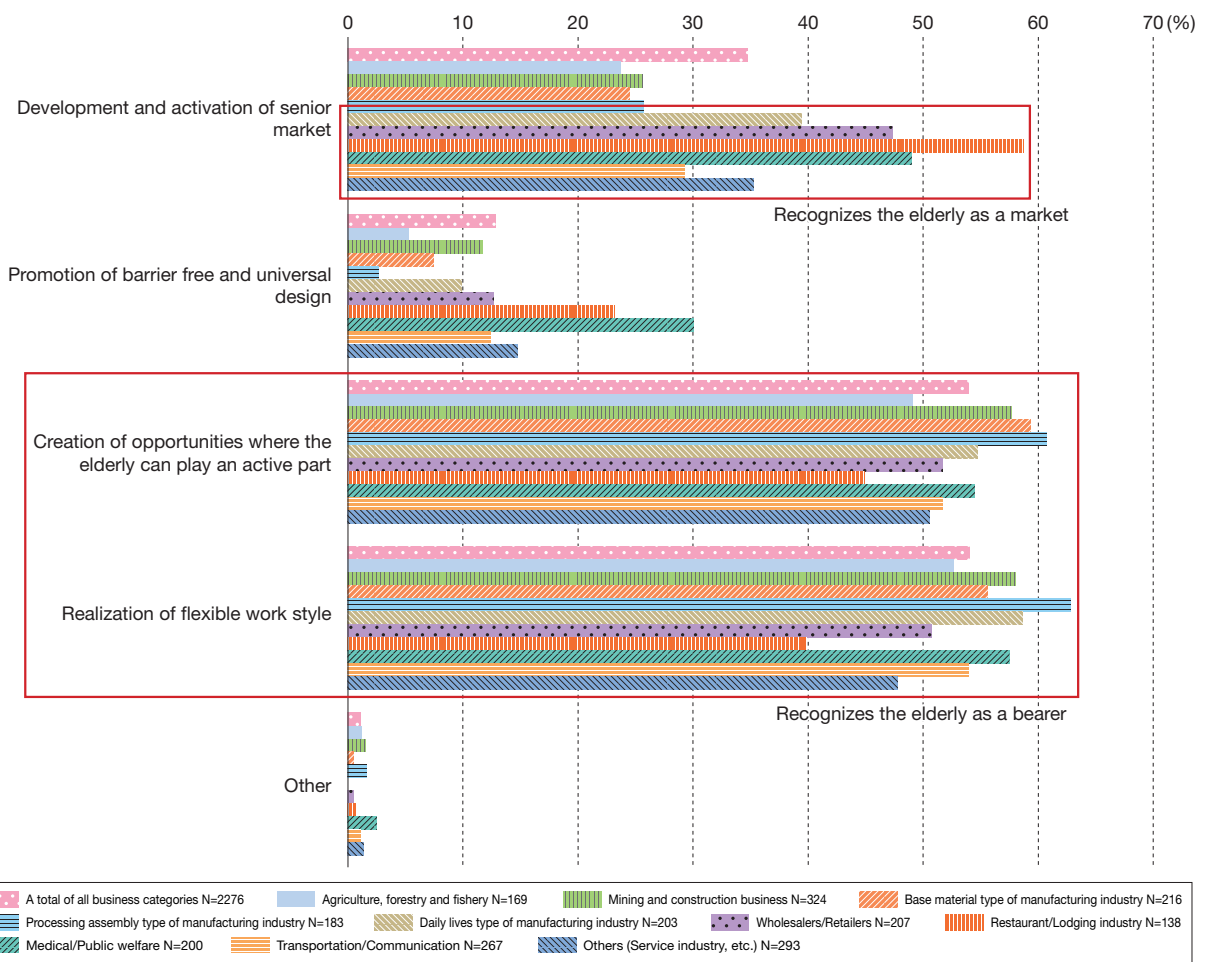
(5) Response to the aging society

When we surveyed how the businesses are aware of the response to the aging society, the overall results showed that they focus on the social participation of the elderly (they recognize the elderly as a bearer). On the other hand, the percentage of the answer about the activation of services for the elderly (they recognize the elderly as a market) is about 60% to the answer seeing their social participation.

The analysis by business categories indicates that daily lives type of manufacturing industry, wholesalers and retailers, restaurant and lodging industry, medical and welfare and other (service industry) have a strong tendency to consider the elderly as a market compared to other industries.

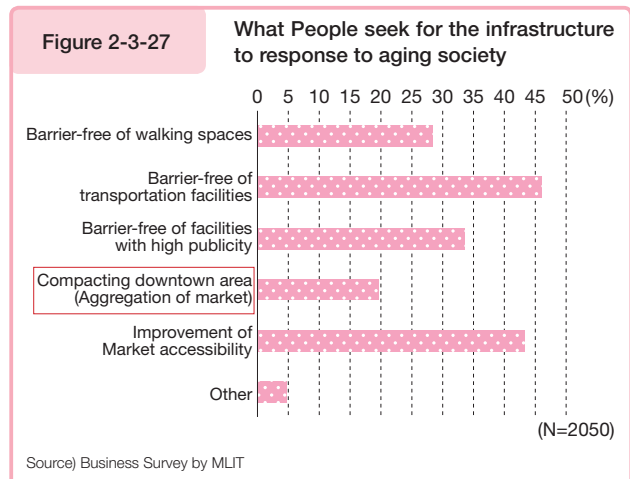
Figure 2-3-26

What they place emphasis on the response to aging society.



(Note) A total of all business categories includes 76 businesses that could not be categorized.
Source) Business Survey by MLIT

Next, when we survey what they seek for the infrastructure to response to aging society, while they indicate a strong awareness toward barrier-free and improved accessibility (30% to 50%), they have a relatively lower expectation toward service efficiency with compacting and network (nearly 20%) (Figure 2-3-27). Even so, as described in (1) the improvement of productivity in tertiary industry, the awareness on compacting and network (improving efficiency with the aggregation of market) accounts for about 11%, which is on a high note, giving an impression that they started to recognize compacting and network as a response to aging society to a certain degree.



(6) Information provision for infrastructure development

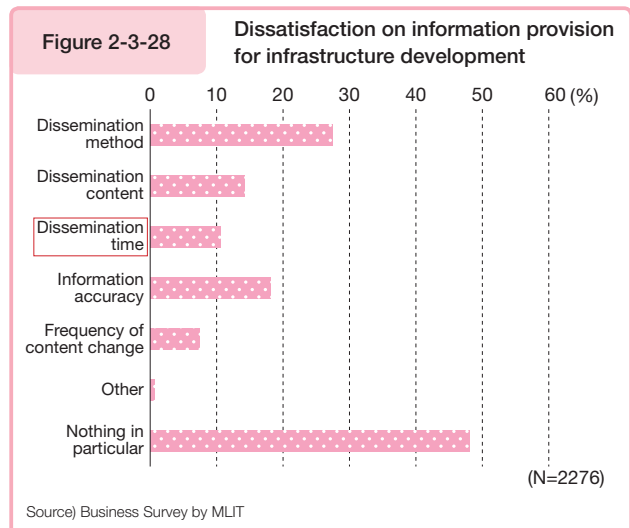
In order to maximize stock effects, it is desirable for private businesses to understand the infrastructure development information to consider business strategy.

To that end, as the result of surveying what private businesses feel dissatisfied with the information provision of infrastructure development, the most common answer was “Nothing in particular”, which comprises about half (Figure 2-3-28).

They are dissatisfied with “the method of dissemination”, which is the most common answer, followed by “information accuracy” and “disseminated contents”. As for “the time of dissemination”, the results account for about 10%, giving the impression that they feel appropriate to a certain extent.

When we asked for their opinions about information provision, their answers include:

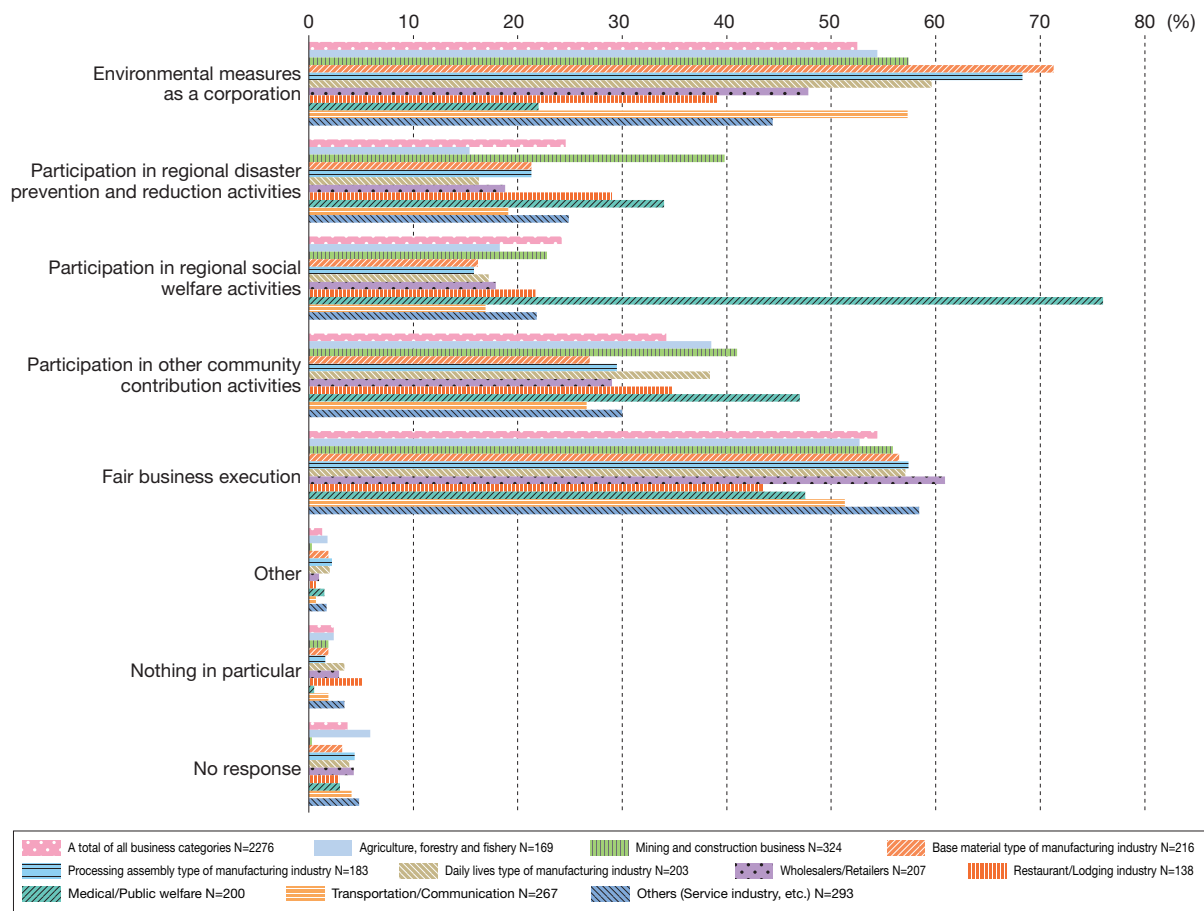
- It is difficult to understand information on websites (agriculture)
- I do not know how to obtain information (manufacturing industry).
- I prefer using social networking services (SNS) and emails for dissemination (manufacturing industry)
- Presentation at train stations, etc. (manufacturing industry)



(7) Awareness of social responsibilities

The survey results on the awareness of CSR (corporate social responsibility) among businesses showed their strong awareness on environmental measures and fair business execution. On the other hand, the analysis by business categories indicates that the manufacturing industry and transport and communication industries are particularly conscious of “environmental measures” and the mining and construction businesses are particularly conscious of “regional disaster prevention and reduction activities” while the medical and public welfare industries are especially conscious of “regional disaster prevention and reduction” and regional social welfare activities, indicating unique consciousness by each business category (Figure 2-3-29).

Figure 2-3-29 What they place emphasis on corporate social responsibilities.



(Note) A total of all business categories includes 76 businesses that could not be categorized.
 Source) Business Survey by MLIT

(The elimination of traffic jam and the promotion of modal shift)

According to the Contractor Survey of the Ministry of Land, Infrastructure, Transport and Tourism, their expectations on infrastructures to take measures for corporate social responsibilities include the elimination of traffic jam (nearly 50%) and the promotion of modal shift (about 18%) (Figure 2-3-30). While a relatively small number of respondents mentioned the promotion of modal shift, compared to other items, the logistic industry in particular is promoting the effort to streamline logistics such as joint transportation and modal shift, which contribute to the elimination of traffic jam through the coalition of cargo owners and logistic companies, in order to response to the shortage of bearers, besides environmental measures.

In addition, some corporations are promoting the streamlining of logistics such as more advanced modal shift. By introducing these utilization cases, it is necessary to disseminate their efforts widely to promote such efforts among a wide range of businesses concerned.

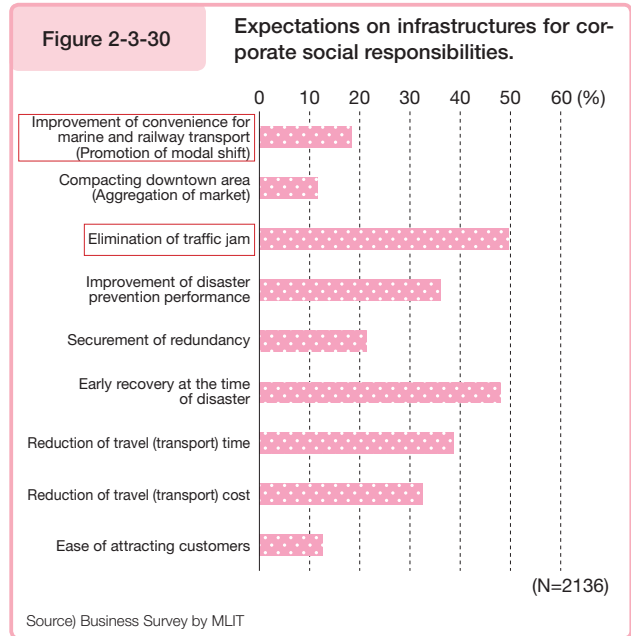
■ Cases of modal shift

- Nestle Japan Ltd., Zenkoku Tsuun Ltd. and Japan Freight Railway Company, etc.

While the companies are making modal shift to railways and coastal shipping, they are promoting the standardization of palletizing operation (the standardization of cargo handling method, which products are loaded on pallets) and the promotion of utilizing diverse human resources such as women through the release of external drivers of childcare facilities, as well as environmental measures and countermeasures for the shortage of long-distance drivers in a comprehensive manner.

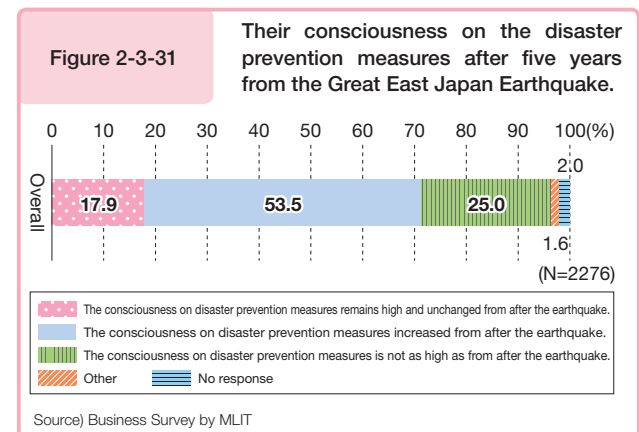
- SHIMAMURA Co., Ltd., Nohhi Logistics Co., Ltd., Japan Express Logistics Corp., etc.

After unpacking and unloading import cargos, the companies converted the empty marine containers for domestic cargos and switched the transport of clothing and bedding from truck to railway. In addition, they load machinery on empty containers as export cargos and transfer to Tokyo by railway for export.



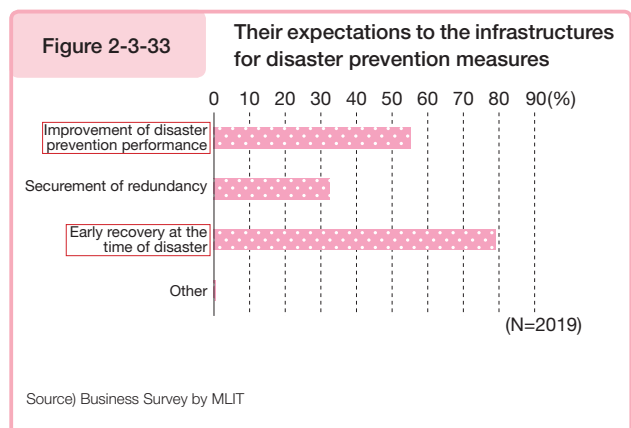
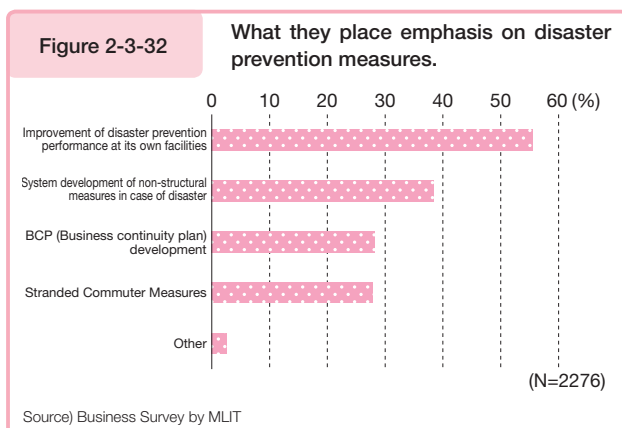
(8) Awareness on disaster prevention measures

Since five years have passed from the Great East Japan Earthquake, we surveyed the consciousness of the current disaster prevention measures. As the result, nearly 70% of the average of all business categories responded that they are still highly conscious or they raised their consciousness, compared to the consciousness immediately after the earthquake (Figure 2-3-31). After all, even five years have passed after the earthquake, the businesses still strongly remember the Great East Japan Earthquake. Also, after the Great East Japan Earthquake, there seems to be an impact of major disasters such as sediment-related disasters and heavy rainfall/floods.



Next, the survey on the awareness of corporate activities on disaster prevention measures revealed that they are conscious of the promotion of disaster prevention performance of their own company’s facilities, followed by the system development of non-structural measures and the development of BCP (Business Continuity Plans) (Figure 2-3-32).

On the other hand, as for the survey on what they seek from the infrastructures as a countermeasure for above, the response, “the early recovery at the time of disaster” exceeded “the promotion of disaster prevention performance” (Figure 2-3-33).



We can infer that this shows the consciousness of private businesses that they experienced major disasters such as the Great East Japan Earthquake and they are somewhat prepared for unavoidable disasters and seek early recovery after disasters.

(9) Expectations on inbound tourism

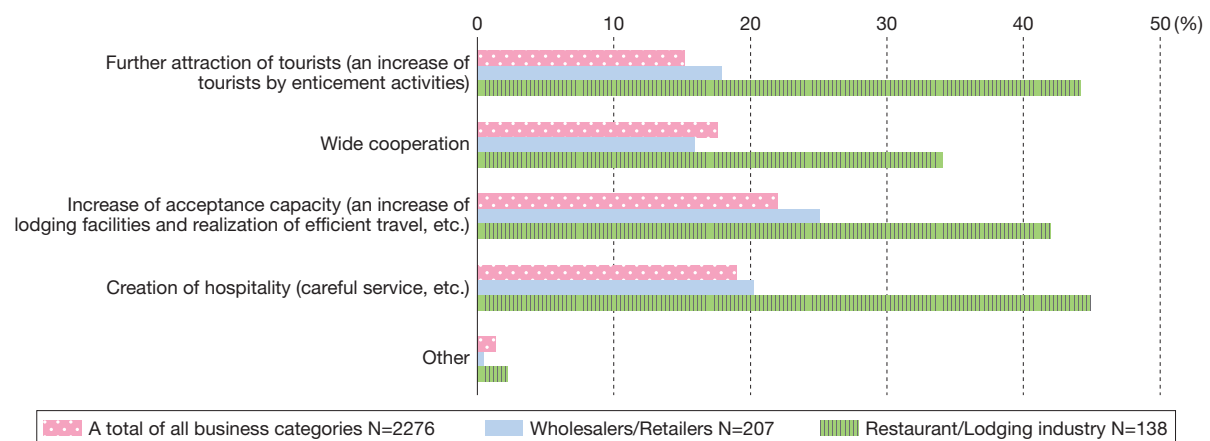
The number of tourists visiting Japan from abroad is increasing yearly and people’s expectations on the economic front are on the rise. To that end, we surveyed what they place emphasis on corporate activities for inbound tourism.

The business category that indicated the most active awareness was the restaurant and lodging industries. As an expectation on so-called binge shopping, although we also anticipated that the wholesalers and retailers show a high expectation, the results were not so different from the total of all business categories (Figure 2-3-34).

Here, the analysis of their expectations on infrastructures indicates that they are seeking the construction of broad sightseeing routes, the functional enhancement of traffic facilities (improvement of transfer convenience) and the enhancement of information provision for foreigners (Figure 2-3-35).

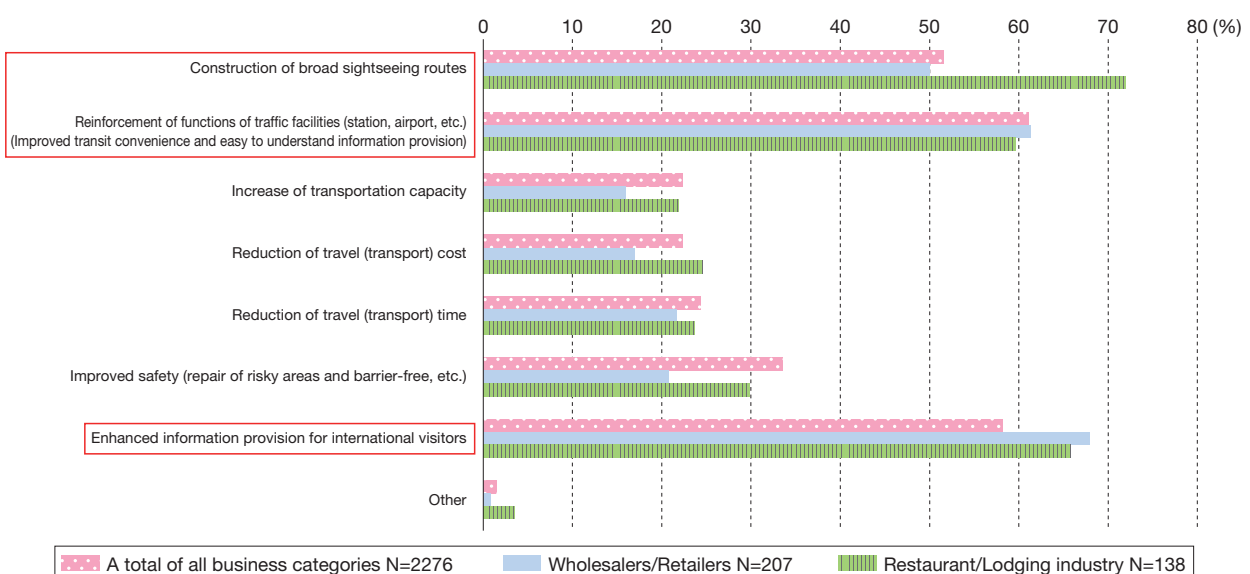
Above expectations are stronger than the increase of transportation capacities and the reduction of travel costs. Other than increasing capacities, the results indicate their awareness that they have not been able to fully lead foreign tourists to all over the country.

Figure 2-3-34 What they place emphasis on the response to inbound tourism.



Source) Business Survey by MLIT

Figure 2-3-35 What is sought for infrastructures to respond to inbound tourism



Source) Business Survey by MLIT

Summary

According to the questionnaire survey on the private businesses, who are the users of infrastructures, we confirmed that they have high expectations on infrastructures, such as traveling (transport) time and the reduction of costs ^{Note 52}, for increasing the productivity of corporate activities, indicating diverse and close relation with the infrastructures. On the other hand, for the proposal of a smart use of infrastructures, not many private businesses take an active stance indicating their willingness to participate ^{Note 53} and many answered “Neither.”

In addition, According to monitor survey targeting citizens (individuals), as for the maintenance management of infrastructures through resident participation, more than 60% of the citizens wish to take part, indicating a high level of willingness to participate ^{Note 54}.

From a historical angle, during the Edo period, it was often that residents developed bridges on their own for utilization to support their economic activities. For instance, 90% of bridges in Osaka were built by residents, which are called town bridges. The 808 Bridges of Naniwa supported the residents’ economic activities and played a important role in supporting the development of daily lives and cities ^{Note 55}. In the Osaka city surrounded with many waterways, the bridges are required infrastructures. It is thought that the merchants at that time had good understanding of the functions, make the best of functions, supported economic activities and contributed to the development of a mercantile city, Osaka.

At present, there are many cases similar to Edo period, such as the location of a new plant by FANUC Corporation in Tochigi, the construction of a new plant by Daihatsu Motor Kyushu Co., Ltd. in Nakatsu Port in Oita and the transfer of headquarters in the same area, as well as the advancement of Niigata JAMCO to Murakami, Niigata. The private businesses build new plants, etc. in order to utilize the convenience in a proactive manner ^{Note 56}, by keeping with or expecting the development of transportation infrastructures such as roads, ports and harbors.

Although historical backgrounds vary, the above cases share a common ground that the private entities recognize the functions of infrastructures to make maximum use of infrastructures, and as a result, it leads to increase economic activities and corporate activities.

In this way, if the corporations focus attention on stock effects by infrastructure development to make maximum use of the effect, it would appear that it leads to increase in the productivity of corporations. For the administration, it is important to approach the visualization of seeing and showing stock effects.

For instance, as introduced in Section 1, Chapter 2, with the use of big data, questionnaires and other various methods, we can expect that the stock effects are understood objectively as much as possible to make available to the public (“visualizing”) and by providing stock effects more effectively to share with users (namely “visualizing”), the users of infrastructures can realize the stock effects much further.

For the future, based on the perspectives above, it is required to increase social-based productivity and contribute to sustainable and strong growth by putting effort into strategic infrastructure development, such as “smart investment and use” and “visualizing” the stock effects.

Note 52 By narrowing down to the Tertiary Industry in particular, the results show that they have a higher expectation to the ease of attracting customers, lively space and the aggregation of markets than other industries.

Note 53 By industries, the restaurants and lodging industries score prominently high and the basic material type manufacturing industry scores extremely low.

Note 54 Refer to Section 2-1, Chapter 1.

Note 55 Source: The website of Osaka-shi

Note 56 Refer to Section 1-1, Chapter 2.

Chapter 3

Cultivating and Expanding New Markets, Securing Leaders, and Adopting New Technologies

In Section 1: Cultivating and Expanding New Markets of Chapter 3: Cultivating and Expanding New Markets, Securing Leaders, and Adopting New Technologies, we will introduce initiatives relating to the overseas development of infrastructure systems and examples of the incorporation of inbound visitors based on the use of infrastructure from the standpoint of the importance of the incorporation of overseas growth fields into Japan, a country that is undergoing depopulation.

In Section 2: Securing Leaders for the Development of Infrastructure, Improving On-Site Productivity, and Adopting New Technologies, we will introduce various initiatives, including one that consists of the establishment of Japan Infrastructure Management Council (tentative name) for the purpose of leading the world in cultivating and activating a maintenance sector and promoting local industrialization in connection with measures to deal with securing and cultivating leaders in the construction industry who will serve as leaders in the development of infrastructure (such as by improving working conditions; ensuring steady, ongoing reviews; and promoting actions taken by young people and women) and measures to deal with the pressing issue of the superannuation of infrastructure. On the part on *Improving On-Site Productivity*, we will introduce the i-Construction initiative for enhancing productivity through the incorporation of ICT into the various processes involved in developing infrastructure and the latest trends in the development and adoption of next-generation robots for societal infrastructure, which are used to inspect infrastructure.

Section 1 Cultivating and Expanding New Markets

1 Overseas development of infrastructure systems

As we saw in chapter 1, Japan's domestic market is expected to shrink as the population declines due to the aging of the population and falling birthrates. At the same time, the infrastructure needs of the world are huge and are expected to continue growing. Against this backdrop, it is important that we proactively respond to the huge global demand for infrastructure by proceeding with the overseas development of infrastructure systems in order to support Japan's economic growth. We will analyze and look into the state of the overseas development of infrastructure systems below.

(1) Global demand for infrastructure and international competition (Vigorous global demand for infrastructure)

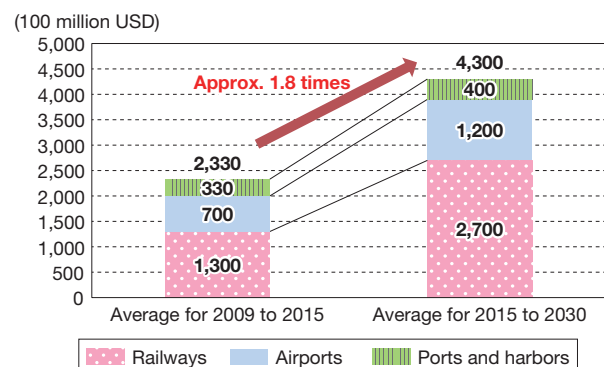
As we saw in chapter 1, the global demand for infrastructure in 2030 will exceed USD 2,326 billion per year according to the Organization for Economic Co-operation and Development (OECD).

If we examine the demand for the development of railways, airports, ports, and harbors, we see that the average annual amount of demand for the years between 2015 and 2030 (USD 430 billion) is expected to be approximately 1.8 times greater than the average annual amount of demand for the years between 2009 and 2015 (USD 233 billion) (Figure 3-1-1).

If we focus on demand for infrastructure in Asia, it is estimated that approximately USD 8.2 trillion (annual average of approximately USD 750 billion) will be needed

Figure 3-1-1

Increasing global demand for the development of railways, airports, and ports and harbors



Source) Developed by the MLIT based on *Strategic Transport Infrastructure Needs to 2030* (OECD 2012)

in the eleven-year period between 2010 and 2020 [Note 57](#).

This data point establishes that the global demand for infrastructure is huge and growing.

(Shortage of funds for infrastructure investments)

At the same time, the gap in funding supplied in response to soaring demand (in other words, the infrastructure gap) is recognized as an international issue [Note 58](#). In emerging and developing countries, it is estimated that there is an infrastructure gap of USD 452 billion per year [Note 59](#). Just dealing with a lack of funds would be difficult given the dire fiscal situation that arises from any attempt to cover costs with only domestic funds, such that the use of private funds is believed to be necessary.

(Significance of the overseas development of infrastructure systems)

While the above describes what is happening in terms of the global demand for infrastructure, the overseas development of Japanese infrastructure systems would be advantageous for both (i) the seller (Japan) and (ii) buyers (other countries).

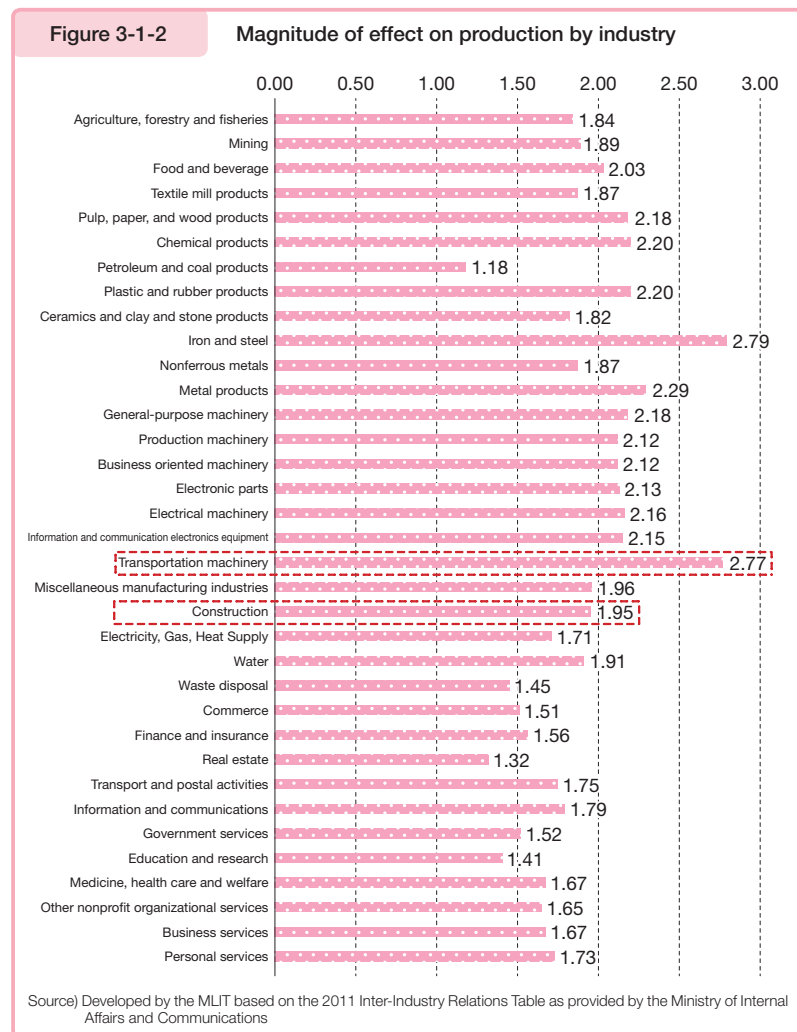
(i) Achieving Japan's economic growth

The overseas development of infrastructure systems will, as indicated in chapter 1, boost GDP and GNI and contribute to Japan's economic growth. By demonstrating the stock effects of developed infrastructure in local areas, we believe that the overseas development of infrastructure systems will also help in terms of the overseas expansion of Japanese companies.

By cultivating markets utilizing the IoT and other new technologies and otherwise proactively capturing the soaring overseas demand for infrastructure, outcomes that can help reinforce Japanese corporate structures and fortify price competitiveness and productivity can be expected.

If we look at the magnitude of the production spillover effect by industrial sector [Note 60](#), we see that transportation machinery (2.77) is second only after steel (2.79) (Figure 3-1-2) [Note 61](#).

Outside of the manufacturing industry, construction (1.95) also rates highly. While these



[Note 57](#) *Infrastructure for Asian Connectivity*, Asian Development Bank (ADB) (2012).

[Note 58](#) PENSION FUNDS INVESTMENT IN INFRASTRUCTURE: POLICY ACTIONS, OECD (2011); "Toward an effective PPP business model: An eight-point for closing the infrastructure gap", World Bank.

[Note 59](#) "Infrastructure Investment Demands in Emerging Markets and Developing Economies," World Bank (2015).

[Note 60](#) Refers to the vertical sum of the inverse matrix coefficient table for an inter-industry relations table. An inverse matrix coefficient is a coefficient that expresses how much production will take place in the given category through demand for funds or services (subject to intermediate inputting) required for production in the given category where one new unit of final demand for the given category is generated.

[Note 61](#) Steel has a large impact on its own category (impact of steel on its own category accounts for 2.19 out of the 2.79 figure indicated here).

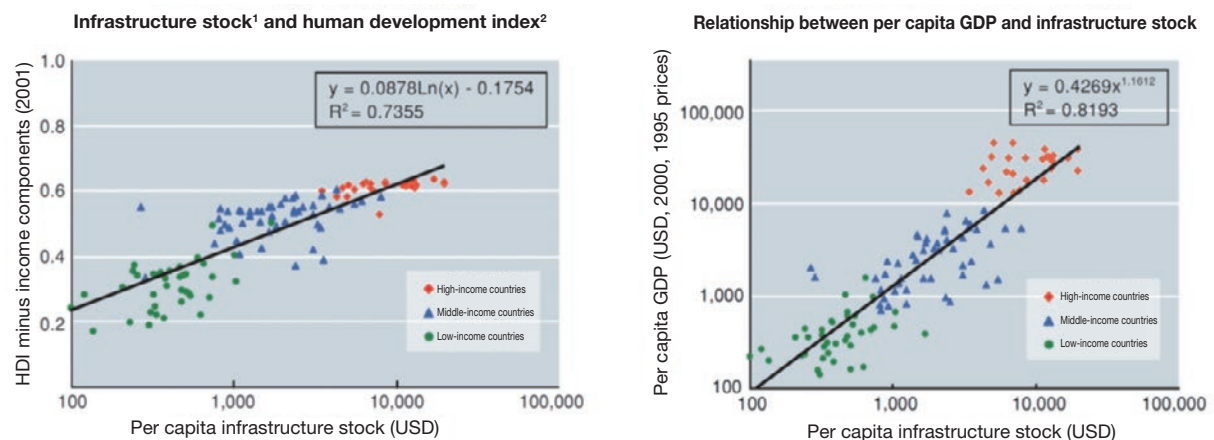
figures correspond to domestic increases in demand, it should be noted that a significant spillover effect is also likely to spread to other domestic industrial sectors as the size of the market for each of these sectors grows through the overseas development of infrastructure.

(ii) Contributing to partner countries and the international community

The text in (i) above sets forth the significance of development for the seller, in other words Japan. However, the abundant lives of people in partner countries through the realization of stock effects by developed infrastructure is also exceedingly important.

As indicated in Figure 3-1-3, both the human development index (HDI) and GDP relate proportionally to the stock of infrastructure.

Figure 3-1-3 Correlations between infrastructure and social development/economic development



(Notes) 1 Per-capita infrastructure stock is calculated by multiplying the amount of infrastructure stock related to electricity, roads, railways, water supply and sewerage systems, landline telephones, and mobile telephones in each country in 2000 by average prices divided by population.
 2 HDI minus income components: Sum of three measures: average life expectancy (number of years), adult literacy rate (15 years of age and older) (%), and combined primary, secondary and tertiary gross enrolment ratio (%). With 0.67 constituting the highest attainable value, the higher this value the better. Equal to HDI minus income components.
 3 Source: UNDP (2002), Human Development Report, M. Fay & T. Yepes (2003)
 Source) Japan International Cooperation Agency (JICA)

Infrastructure fundamentally belongs to the location where it is situated. Proposals for optimal infrastructure systems based on needs that reflect the climate and culture of the partner countries are required.

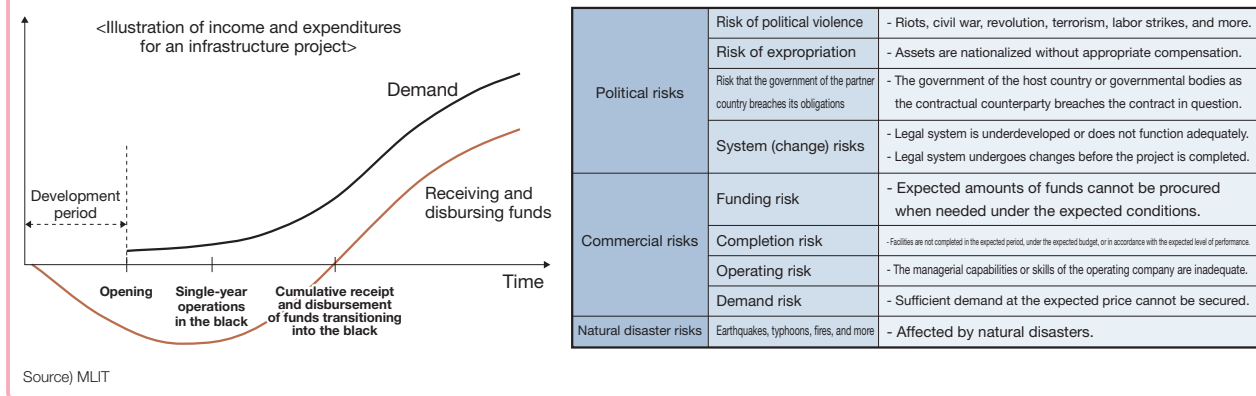
In addition to generating win-win outcomes in terms of growth for Japan and our partner countries, we believe that the act of contributing to the formulation of solutions to problems on a global scale—including those that concern urban issues, the environment, and disaster prevention—through the overseas development of quality infrastructure will also help to raise the profile of Japan on the global stage.

(Overseas infrastructure project risks)

Even as overseas infrastructure projects are meaningful as explained above, they also carry specific risks.

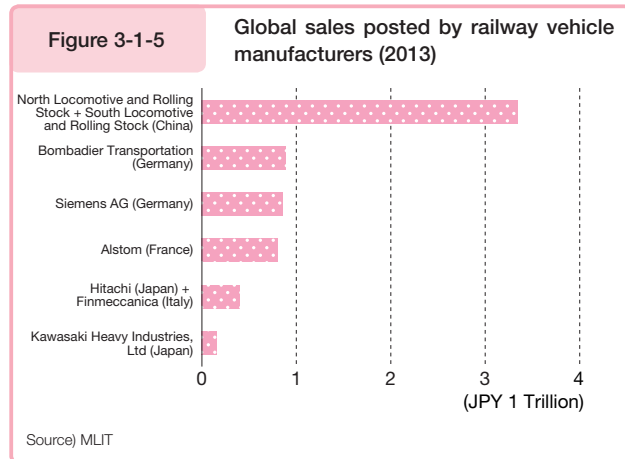
First, as outlined in the left-side illustration in Figure 3-1-4, infrastructure projects—both domestic and overseas—require huge amounts of investments, the return on which may correspond to a very long timeline. Additionally, as outlined in the right-side illustration in Figure 3-1-4, risks can be broadly divided as follows: political risks, commercial risks, and natural disaster risks. For example, many infrastructure projects involve a significant contribution on the part of the government of the partner country. In emerging countries, contractual violations by the government and unilateral rule changes made once the project is underway occur frequently (breach-of-obligation risk and systematic (revision) risk). There is also a demand risk in that we might not know whether users will increase in number over time as expected.

Figure 3-1-4 Main risks associated with overseas infrastructure projects



(Fierce international competition in the infrastructure market)

International competition over the soaring global demand for infrastructure is exceedingly fierce. For example, if we look at sales figures posted by rail car manufacturers around the world, we see that, thanks to soaring domestic demand, a superior cost-competitive edge, and an effective foreign policy in China, Chinese enterprises are presently crushing European companies (“Big 3”) that have long dominated the market (Figure 3-1-5).



(2) Overseas development of quality infrastructure

The biggest advantage offered by Japanese infrastructure is quality. As captured by the traditional proverb in Japan that can be translated into “penny-wise and pound-foolish”, there is a willingness in this country to choose items that are easier to use, last longer, and are of good quality even at the cost of paying a little more for such items.

In May 2015, Prime Minister Abe introduced Partnership for Quality Infrastructure in Japan. In November of the same year, an expansion of a program to accelerate procedures for further acceleration of Japanese ODA loans to facilitate quality infrastructure investments was announced. In these and other ways, the government is spearheading the promotion of quality infrastructure investments.

Japanese concepts of ‘quality’ in the overseas development of infrastructure is embodied in the ease of use, longevity, and low lifecycle costs of infrastructure, in adherence to deadlines, in the consideration paid to environmental and disaster-prevention concerns, and in other values. In addition, superior technological strengths as seen in structural elements combined with efforts concerning non-structural elements, such as the establishment of systems and the provision of support for the development of human resources, also contribute to the enhancement of quality. In accelerating the process of supporting the provision of ODA loans to partner countries, competitiveness is reinforced through the expansion of systems pertaining to the aforementioned *quality infrastructure partnerships*.

The promotion of quality infrastructure investments that harness Japanese strengths is not only linked to the stimulation of the Japanese economy when Japanese companies receive new orders for infrastructure systems from overseas clients but also significant for promoting the development of infrastructure that is easy to use and long-lasting for our partner countries. For this reason, it is important that Japan continues to engage further in such efforts.

(Technological excellence of structural aspects and the advantages conferred by non-structural elements: Shinkansen [bullet trains] Lines—a high-speed rail system that is the pride of Japan)

The Shinkansen, Japan's high-speed rail system, was launched with the opening of the Tokaido Shinkansen line in 1964. Since then, this system has compiled an extensive track record of excellence and can rightfully be described as one of Japan's proudest achievements in terms of quality infrastructure. The Shinkansen's main claims to superiority consist of the following (Figure 3-1-6):

- (i) Safety: Over the course of fifty-one years of operations, there have been exactly zero incidents giving rise to passenger deaths. An earthquake-detection system has also been adopted.
- (ii) Reliability: The Tokaido Shinkansen operates at a peak frequency of fifteen trains per hour; irrespective of this high frequency of operations, the average delay time is less than one minute.
- (iii) Efficiency: Significantly, lightweight cars are employed. At the same time, tunnels and other civil engineering structures are small, which means that construction costs can be kept low.

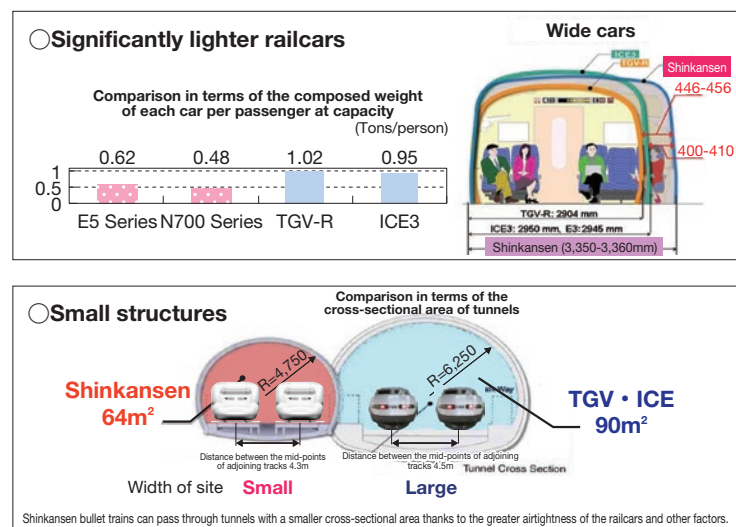
It is understood that the superiority of the Shinkansen can be attributed to the technological excellence of trains, signal systems, and other structural elements. Superior expertise with respect to non-structural elements, such as operations and maintenance, has also contributed a great deal to the positive reputation earned by the Shinkansen.

In addition, the task of cleaning the interior sections of Shinkansen cars has drawn much attention in recent years. Shinkansen trains are given about twelve minutes to turn around at Tokyo Station. If we deduct the time needed by passengers to board and disembark, there are only seven minutes left to prepare a train for turning around while it remains at a standstill. During this time, each staff member takes over a car containing at least one hundred seats and proceeds to rotate the seats; clean the windows, tables, and aisles; change seating covers; and check for lost items. Furthermore, before a train arrives at a station, staff members line up in a single queue at the edge of the platform. They bow to each incoming train

and never fail to bow yet again to passengers getting on or off the train ^{Note 62}. The accuracy, speed, and decorum of such work were featured and lauded in a CNN feature entitled *Tokyo's seven-minute miracle*.

Japan's Shinkansen system was first adopted overseas as a high-speed rail system traveling the length of Taiwan. Since operations began in 2007, high levels of safety and reliability have been maintained. The adoption of a Shinkansen system as a high-speed rail option for a national project is an expression of the trust that others place in Japanese infrastructure. In light of the large earthquake that struck Taiwan in 1999 and other considerations, the safety and robustness of Japan's railway system were points that were taken into account by Taiwan when orders were being placed for Taiwan's high-speed rail system. For the inauguration of this system, technical instructions were provided to Taiwanese workers and follow-up action was taken with respect to non-structural elements. By earning trust in Japan in such a cumulative manner, an agreement was reached in December 2015 between Japan and India that called for the introduction of a Shinkansen system for a high-speed rail line between Mumbai and Ahmadabad ^{Note 63}. Japanese companies have been earning the trust of clients and successfully receiving orders in not just the field of high-speed railways but also in various other fields, including those that consist of urban railways, bridges, and other civil engineering projects.

Figure 3-1-6 Comparative advantages of Shinkansen bullet trains



Source) MLIT

Note 62 *The Cleanup Angels of the Shinkansen: How Did the World's Best On-Site Capabilities Emerge?* Isao Endo (2012).

Note 63 Details are provided in the accompanying column piece.

(The development of human resources capable of inheriting Japanese know-how: Matadi Bridge—a friendship bridge linking Japan and the Congo)

The Matadi Bridge was built with Japanese yen loans and has continued to support the economy of the Democratic Republic of the Congo as the only bridge crossing the Congo River for over thirty years since its completion (Figure 3-1-7). Although there was a time partway through that period when Japanese officials were forced to be repatriated due to political strife in that country, it was the staff members of the Organisation pour l'Équipement de Banana-Kinshasa (OEBK) who continued to protect the Matadi Bridge during this time. Relying on a maintenance manual that was left behind, these staff members managed to maintain the bridge through their own self-help efforts while receiving advice through channels of communications established with officials who had returned to Japan. The staff members of OEBK were spurred to action by a sense of responsibility that arose out of a belief that they had to maintain the bridge themselves after the Japanese officials with whom they had worked together and from whom they had received technologies and a proper mindset for maintenance left the country.

In June 2013, a ceremony to commemorate the thirtieth anniversary of the completion of the Matadi Bridge was held. At this time, the original Japanese officials who had worked on the bridge returned to the area at their own expense, cried tears of joy upon reuniting with the staff members of OEBK atop the bridge, and were struck with wonder at how well the bridge had been maintained to look as if it had just been completed.

Japanese infrastructure development enjoys a competitive edge in that proposals can be made on a packaged basis incorporating initiatives concerning non-structural elements in the form of human resources development and the provision of support for the establishment of systems. The utility of the infrastructure in question can be maximized and the long-term growth of the partner country can also be boosted by not just focusing on aspects involved in the development of a business environment for Japanese companies but also performing various examples of after-sales service, such as by operating established systems and maintaining the infrastructure in question after it is completed or by transferring technology to enable the partner country to independently maintain and operate the infrastructure in question. The story of the Matadi Bridge teaches us that the overseas development of Japanese infrastructure does not simply involve the infrastructure itself but is meaningful in a long-term sense in that it helps to cultivate human relationships, fosters pride in a job well done, and allows Japanese infrastructure to take root in local settings around the world.

Figure 3-1-7 Matadi Bridge and a map showing its location



(Source) Image provided by the Japan International Cooperation Agency (JICA)

(3) Strategies and plans of the government and the MLIT

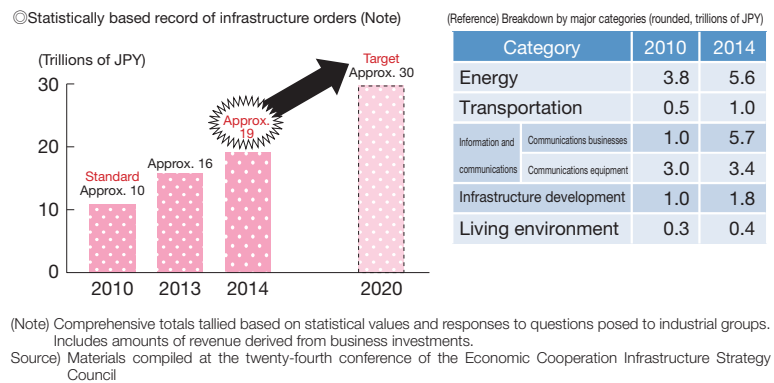
What will be needed to engage in the overseas development of infrastructure in the face of fierce international competition are the autonomous efforts of the private sector, as well as the strategic capturing of markets through private-public partnerships that also include the involvement of top sales executives.

(Infrastructure system export strategy: government strategy)

The government formulated the “Infrastructure System Export Strategy” in May 2013, through which it aims to increase orders for infrastructure systems, which came in at approximately JPY 10 trillion in 2010, to approximately JPY 30 trillion by 2020. Orders increased to approximately 19 trillion yen in 2014 (Figure 3-1-8).

Figure 3-1-8

Record of received orders for Japanese infrastructure and a breakdown by category



(MLIT action plan for the overseas development of infrastructure systems)

In light of the major role played by the MLIT in the overseas development of infrastructure, the MLIT action plan for the overseas development of infrastructure systems was formulated in March 2016.

This action plan specifically sets forth a plan for the fields of land, infrastructure, transport, and tourism in accordance with the Infrastructure System Export Strategy, an overall strategy of the government, and clarifies the following points, which will be important as the MLIT further seeks to reinforce the overseas development of infrastructure.

Point 1 Formulating policies for initiatives by region and country

Projects for the overseas development of infrastructure, which will constitute MLIT-related focal points in different regions and countries, shall be organized and strategic approaches inclusive of the role played by effective top sales officials shall be carried out accordingly. Thorough, maximum efforts shall be expended for the ASEAN region, where economic growth is expected to expand further in the future thanks to the establishment of the ASEAN Economic Community (AEC) and the Trans-Pacific Partnership (TPP) Agreement and which is regarded as both a market that we simply cannot afford to lose and a key battleground. Policies on actions to be taken according to region and country have been stated and key projects that should be placed under scrutiny over the next three to four years have been identified in particular from the standpoint of securing new orders from each country.

Point 2 Reinforcing initiatives concerning non-structural elements

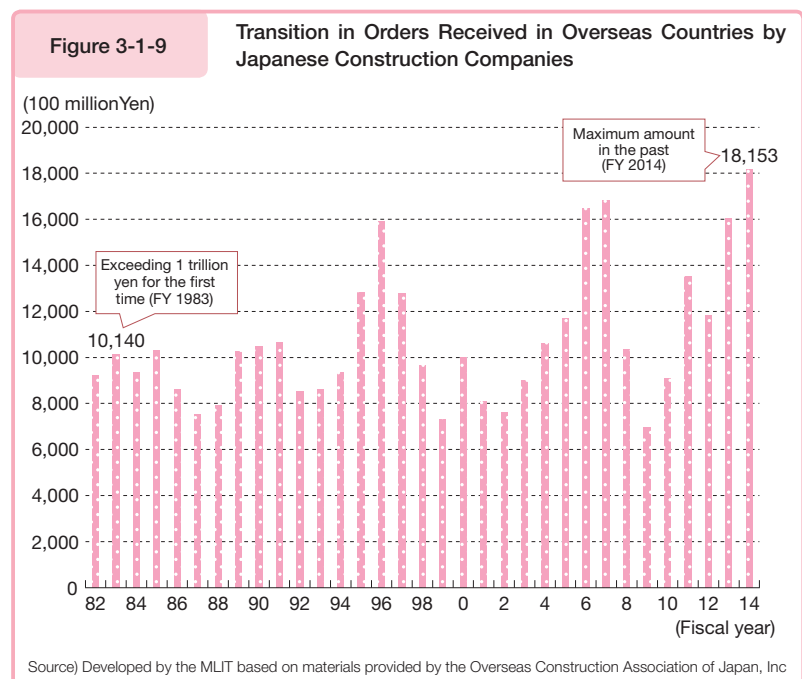
As the competitive advantages enjoyed by Japan comprise not just the structural elements that consist of low lifecycle costs, ease of use, and long service lives, but also the provision of support through non-structural elements, we will combine the development of structural elements with the attainment of international standards, the provision of support for the establishment of systems in partner countries, and the provision of support for the development of human resources to man the operations of such systems, and otherwise promote a package of initiatives concerning non-structural elements.

Point 3 Promoting participation in PPP projects

It would be difficult for the staggering amount of demand for infrastructure around the world to be met with just public investments. We are seeing more and more examples of the use of private funds in infrastructure projects, which have come to represent huge business opportunities. For this reason, the MLIT established the Japan Overseas Infrastructure Investment Corporation for Transport & Urban Development (JOIN), a public-private partnership fund, in October 2014. JOIN will be used to maximum effect to proactively provide support for the overseas development of private sector companies.

Point 4 Promoting the overseas development of the construction sector

In FY 2014, Japanese construction companies posted a record-high JPY 1,815.3 billion in orders from overseas clients (Figure 3-1-9) as a key industry for the overseas development of Japanese infrastructure. In light of expectations that the construction sector will continue to play a significant role, initiatives in terms of the development of a business environment and troubleshooting will be implemented.



Point 5 Reinforcing support for small and medium businesses with ties to the MLIT and the overseas development of their technologies

It is important to unlock latent demand and otherwise proactively provide support, such as by endeavoring to stimulate overseas development on the part of small to medium-sized enterprises and creating opportunities for making forays into overseas markets. Business-matching initiatives shall be carried out in conjunction with the provision of opportunities to engage in top-level sales activities for technologies belonging to small and medium-sized companies in connection with large-scale infrastructure projects.

Point 6 Enhancing competitiveness in terms of price and the speed at which client needs are accommodated

The perspectives of partner countries will be thoroughly considered, system-expansion measures as they relate to the deployment of quality infrastructure partnerships will be utilized to the fullest extent possible, and initiatives to reinforce competitiveness in terms of price and speed will be pursued.

Point 7 Reinforcing promotional activities to effectively elevate the profile of quality infrastructure

In engaging in the overseas development of infrastructure, it will be essential to proactively elevate the profile of quality infrastructure from which Japan derives a competitive advantage for top-level government leaders, high-level public officials, and the citizens of partner countries. Effective, strategic public relations activities shall be undertaken accordingly.

Point 8 Initiatives for new overseas development projects based on the use of information communication technology and other new technologies

Proactive endeavors by Japan to highlight original, superior infrastructure systems, such as by promoting the Internet of things, artificial intelligence, sensors, and other elements of information communication technology; utilizing big data and otherwise deploying new technologies; and harnessing new transportation systems and engaging in advanced forms of urban development, are important.

Point 9 Initiatives to enable Japanese companies to undergo further evolution as global enterprises

In order to further incorporate the huge overseas demand for infrastructure, it is important that Japanese companies reinforce corporate structures and business-promotion systems tied to globalization and clarify more powerful overseas

strategies. The MLIT shall move to implement an action plan and engage in the development of an environment to enable more private companies to embark on overseas development.

Column India's high speed railway

Column

In the Japan-India summit meeting in Delhi, India, on December 12, 2015, both governments signed the memorandum of cooperation regarding the introduction of the Shinkansen system into the high-speed railway between Mumbai and Ahmedabad.

Since the Indian government announced the plan for a high-speed railway in 2009, we had energetically worked, while cooperating with relevant ministries for top-to-top selling through working level jobs in partnership with the private sector, toward the introduction of the Shinkansen system to India. Specifically, we had conducted the Joint Feasibility Study for Mumbai—Ahmedabad High-Speed Railway Corridor, research of the business aspect of this plan, as a cooperative project between Japan and India from December 2013 to June 2015 and had held seminars on high-speed railways four times in India since 2012 while inviting key Indian government officials to Japan in order to promote their understanding of Japan's railway technology, including the Shinkansen system (Figure 3-1-10). In particular, at the International Railway Equipment Exhibition (IREE2015) in October in 2015, Japan participated as a partner country and promoted our high-quality railways, including the Shinkansen system of greater safety and accuracy.

As the results of our continuous and vigorous approaches in the past, and the formation of the public opinion that appreciates Japan's railway technology in the relevant regions, we reached an agreement on the introduction of the Shinkansen system to the high-speed railway system between Mumbai and Ahmedabad. From now on as well, we will work together with the relevant ministries in partnership with the private sector toward realization of the first route for a high-speed railway in India.

Figure 3-1-10 Prime minister Modi of India visits Japan



Source) Website of the Prime Minister of Japan and His Cabinet (http://www.kantei.go.jp/jp/97_abe/actions/201512/12india.html)

2 The incorporation of inbound visitors and infrastructure

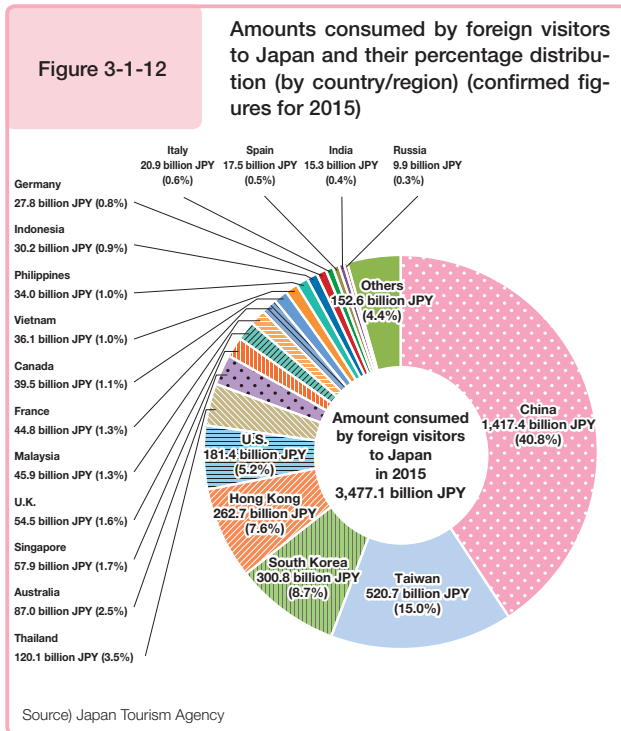
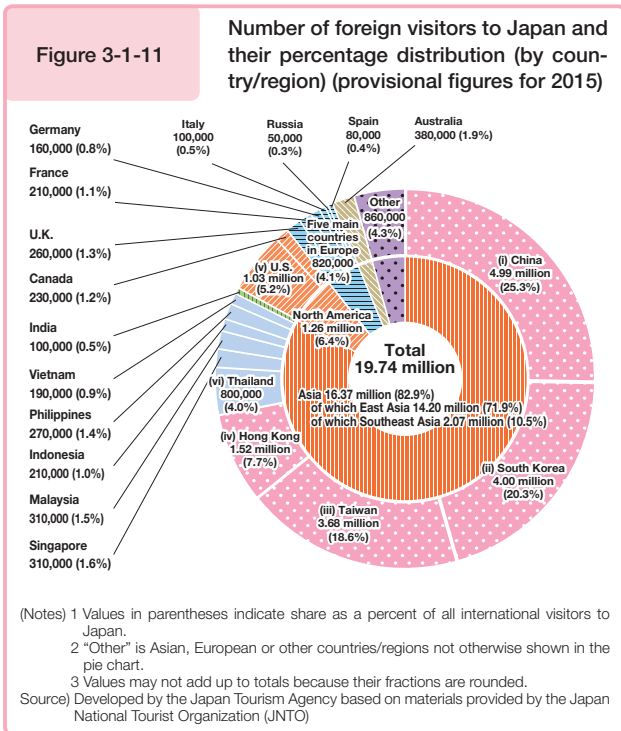
(1) Analyzing trends concerning inbound foreign tourists

(Trends in terms of inbound visits and the status of consumption by country)

According to the UN World Tourism Organization (UNWTO), the number of overseas tourists to Japan in 2015 rose by 4.4 percent on a year-on-year basis (approximately 50 million tourists) to approximately 1,184 million tourists. This number has been rising rapidly since 2010. With respect to the Japanese economy, the domestic market is expected to shrink due to the reduction in the size of the population. It is thus important to integrate demand for inbound tourism from overseas and harness tourism as a trump card for regional revitalization and as a key pillar for a growth strategy designed to enable GDP to reach JPY 600 trillion.

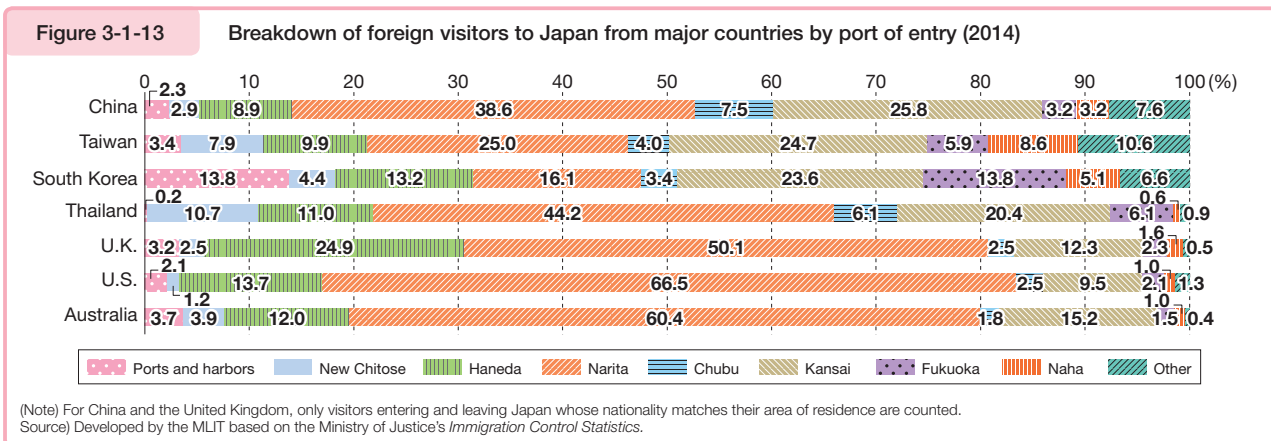
As described in chapter 1, a record number of inbound foreign tourists, 19.74 million, flocked to Japan in 2015 (a year-on-year increase of forty-seven percent) and a record amount of spending by foreign visitors to Japan, JPY 3,477.1 billion, was posted in the same year (a year on-year increase of seventy-one percent).

In particular, demand on the part of inbound tourists from Asia has increased, with the number of inbound foreign tourists and the amount of spending in 2015 both accounting for approximately eighty percent of their respective totals (Figure 3-1-11 and 3-1-12).



(The state of entries and departures)

If we look at the percentages relating to the utilization of airports, ports, and harbors as ports of entry for inbound foreign tourists by airport of entry for major countries, we can see that Narita Airport welcomes the biggest numbers of inbound foreign tourists regardless of nationality, with the exception of tourists from South Korea. Tourists from the United Kingdom, the United States, and Australia overwhelmingly chose to arrive at airports in the Tokyo metropolitan area, namely Haneda Airport and Narita Airport. In contrast, many tourists from the Asian region—namely China, Taiwan, South Korea, and Thailand—also chose to arrive at Kansai International Airport. As tourists from South Korea and Taiwan often take regular flights to regional airports, airports of entry have become diversified. With many tourists from South Korea in particular also arriving at ports and harbors, modes of entry are varied. The regions within Japan that welcome foreign tourists from nearby Asian countries are likewise diversifying. For example, more Thai visitors arrive at New Chitose Airport than tourists from other countries.



Column

Realization of the era of welcoming one million foreign visitors by cruise ships

MLIT has accelerated improvement of the environment for reception of cruise ships and tried to realize the era of welcoming one million foreign visitors by cruise ships in 2020, in order to revitalize regions through

travels to Japan by cruise ships under the Action Program toward Realization of Japan as a Tourism-Oriented Country.

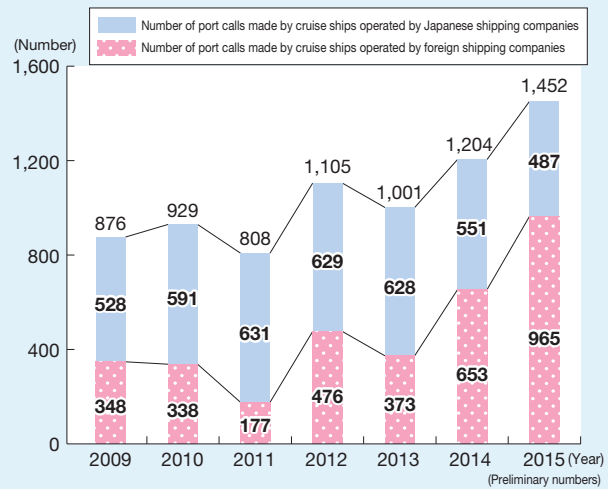
For this purpose, we set up a one-stop counter in the Harbors Bureau, responded to inquiries from cruise shipping companies in a unified manner, and advanced initiatives in cooperation with the National Cruise Vitalization Conference and in partnership with the private sector, such as promotions through meetings for business negotiations involving the participation of cruise shipping companies and port administrators, enhancement of websites that integrate data from port facilities and the tourist information around ports of call, improvements to the piers that accept large cruise ships, and establishment of the notification system for temporary tax-free shops at the piers for cruise ships.

Partly because of these efforts, the number of calls at ports hit a record high 1,452 (preliminary numbers) in 2015 (Figure 3-1-14). In addition, the foreign visitors to Japan by cruise ships exceeded one million a year in December of the same year, achieving the target number five years earlier than we planned (Figure 3-1-15 and 3-1-16).

Cruise ships have called at ports throughout Japan, bringing high tourism consumption and prosperity to each region and contributing to the vitalization of local districts. Furthermore, when the ships have visited ports, local high school students have guided the foreign tourists to sightseeing places, so the calls of cruise ships have provided opportunities for young human resources in Japan to rediscover the attractiveness in local districts and for cultural exchanges between the residents and foreign visitors.

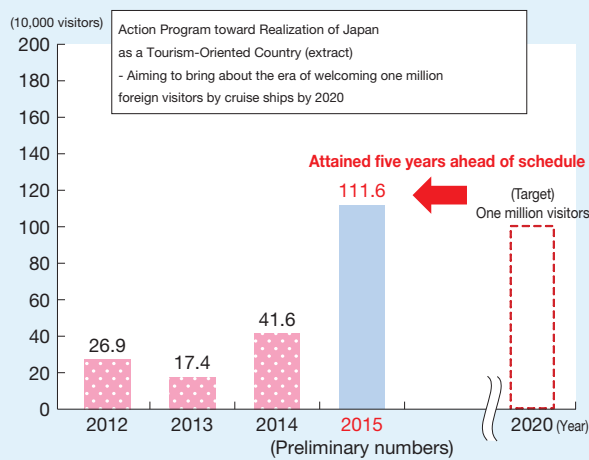
In the Tourism Vision Design Council for supporting the tomorrow of Japan held on March 30, 2016, a new goal to achieve five million foreign visitors by cruise ships in 2020 has just been set. From now on as well, MLIT will aggressively take the initiative in both non-structural and structural elements in order to vitalize the local districts through cruise promotion.

Figure 3-1-14 Number of port calls made by cruise ships at Japanese ports



(Note) Figures for 2015 constitute preliminary numbers obtained by asking port administrators and are subject to revision in the future.
Source) MLIT

Figure 3-1-15 Number of Foreigners Who Enter Japan by a Cruise Ship (rounded figures)



(Notes) 1 For the years up to 2014, rounded figures are based on numbers of foreign visitors as derived from totals supplied by the Ministry of Justice's Immigration Bureau (excluding the crews).
2 Where a cruise ship on a single cruise trip makes port calls at multiple ports, the number of foreign visitors is calculated by deeming that each visitor enters the country once (rather than deeming that a visitor enters the country every time a port call is made at a different port).
Source) MLIT

Figure 3-1-16 Ceremony to commemorate of welcoming one million foreign visitors to Japan by cruises ships (held in the Central Pier Cruise Center at Hakata Port on December 8, 2015)



Source) MLIT

(Modes of travel undertaken by visitors to Japan from the Asian region)

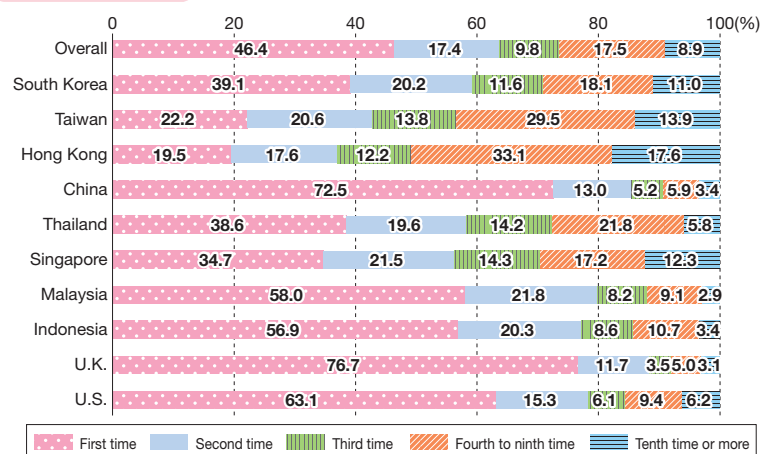
Next, let us examine, by focusing on the top eight countries in Asia in terms of the number of tourists to Japan, the characteristics, in terms of purpose of travel and the locations that are visited, of inbound foreign tourists from Asia whose numbers are expected to continue rising.

According to a 2015 Consumption Trend Survey for Foreigners Visiting Japan, there are many countries whose tourists indicated that they were visiting Japan at the time for the first time. Just over seventy percent of tourists from China, the country that accounts for the most number of visitors to Japan, indicated for this survey that they were visiting Japan for the first time. On the other hand, approximately half of all tourists from Hong Kong reported that they were visiting Japan for at least the fourth time, such that one can conclude that many travelers from Hong Kong make repeated trips to Japan (Figure 3-1-17).

If we examine the methods by which trips were arranged, we see that Chinese tourists (56.2 percent) tended to participate in group tours the most followed by tourists from Taiwan (44.7 percent). In all other countries, tourists choosing to arrange trips on their own outnumbered tourists choosing to arrange trips by any other means (Figure 3-1-18). In tying these figures to the number of visits made to Japan, we believe that there is a meaningful correlation between the high percentage of Chinese tourists who indicated that they were visiting Japan for the first time and the high percentage of Chinese tourists who were participating in packaged tours.

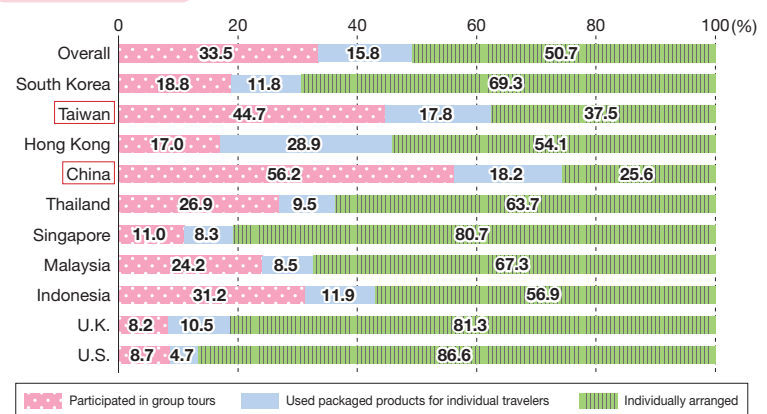
According to a survey on the intentions of inbound foreign tourists from eight regions across Asia that was conducted by the Development Bank of Japan jointly with the Japan Travel Bureau in July 2015 ^{Note 64}, many tourists indicated that they would like to freely engage in tours when asked about their general attitude

Figure 3-1-17 Number of visits to Japan by foreign visitors to Japan from major countries (for tourism and pleasure)



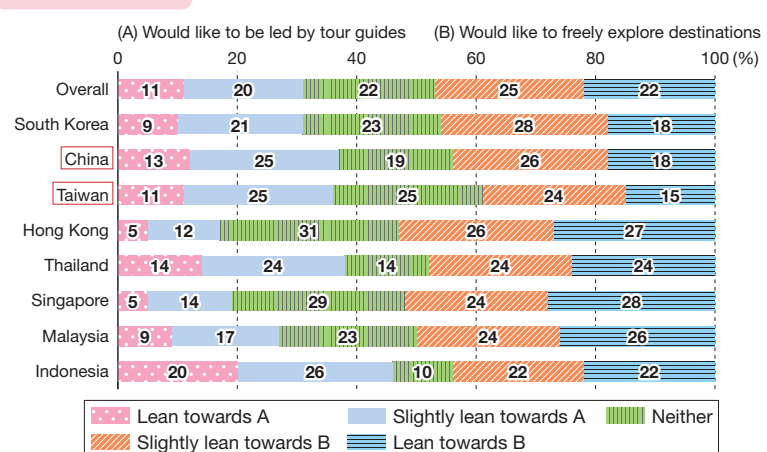
Source) Developed by the MLIT based on the 2015 Consumption Trend Survey for Foreigners Visiting Japan (Japan Tourism Agency)

Figure 3-1-18 Methods by which trips were arranged by foreign visitors to Japan from major countries (for tourism and pleasure)



Source) Developed by the MLIT based on the 2015 Consumption Trend Survey for Foreigners Visiting Japan (Japan Tourism Agency)

Figure 3-1-19 Tour styles desired for overseas trips



Source) Survey on the Intentions of Inbound Foreign Tourists from Eight Regions Across Asia (2015) (Development Bank of Japan/Japan Travel Bureau)

Note 64 An online survey administered to male and female individuals aged between twenty and fifty-nine years who have previously traveled overseas residing in eight regions across Asia (South Korea, China, Taiwan, Hong Kong, Thailand, Singapore, Malaysia, and Indonesia). Approximately 500 respondents from each country gave valid responses for a total of 4,111 respondents who gave valid responses. (This survey was administered in China only to residents of Beijing and Shanghai, with half of respondents residing in Beijing and half of respondents residing in Shanghai.)

concerning overseas travel, such that the number of individual travelers to Japan is expected to increase (Figure 3-1-19).

Tourists who have previously been to Japan also indicated a high degree of desire to visit tourist destinations in local regions. In particular, we can see that tourists are exposed to the appeal of regional areas once they visit tourist destinations in local regions and are likely to be more eager to visit such destinations in the future (Figure 3-1-20). In terms of what tourists would like to do at tourist destinations in local regions, responses show that tourists wish to engage in experiences that are unique to the given location, such as by consuming locally grown foods and visiting hot springs and enjoying a nature-based experience.

Figure 3-1-20

Survey as to whether or not visits have been made to local regional tourism destinations in Japan and on intentions to visit in the future (administered to people who have previously visited Japan)

(Single choice)

Respondents→		Overall	South Korea	China	Taiwan	Hong Kong	Thailand	Singapore	Malaysia	Indonesia
Sample size		2,153	329	335	366	388	242	228	127	138
Have visited previously	I have visited previously and would definitely like to visit again.	35%	21%	44%	33%	39%	40%	35%	29%	42%
	I have visited previously and would like to visit again if an opportunity arises.	32%	37%	31%	37%	28%	33%	26%	28%	32%
	I have visited previously but do not really wish to visit again.	4%	6%	2%	2%	5%	3%	4%	6%	2%
	I have visited previously but cannot see myself visiting again.	2%	4%	1%	1%	1%	2%	3%	2%	4%
	(Subtotal) Have visited previously	73%	67%	78%	74%	73%	77%	68%	66%	80%
Have not visited previously	I have not visited previously but would definitely like to visit someday.	16%	18%	16%	16%	12%	13%	21%	21%	14%
	I have not visited previously but would like to visit someday if an opportunity arises.	10%	14%	6%	9%	13%	8%	8%	11%	6%
	I have not visited previously and do not really wish to visit someday.	1%	0%	0%	0%	1%	1%	2%	1%	0%
	I have not visited previously and cannot see myself visiting someday.	1%	1%	0%	1%	2%	0%	2%	1%	0%
	(Subtotal) Have not visited previously	27%	33%	22%	26%	27%	23%	32%	34%	20%
(Subtotal) Definitely would like to visit	51%	39%	60%	49%	51%	53%	55%	50%	57%	
(Subtotal) Definitely would like to visit + would like to visit if an opportunity arises	93%	89%	97%	96%	92%	94%	89%	90%	94%	

(Notes) 1 Questions regarding local regional tourist destinations were asked in terms of areas situated at a distance from the Tokyo metropolitan area and other metropolitan areas.

2 Questions were posed to people who have previously visited Japan as to whether or not they visited a local regional tourism destination during their most recent visit to Japan and as to their intentions to visit a local regional tourism destination in the future.

(Source) Survey on the Intentions of Inbound Foreign Tourists from Eight Regions Across Asia (2015) (Development Bank of Japan/Japan Travel Bureau)

Stimulating the economy through the development of a system of accepting tourists and the establishment of tourism destinations that reflect the unique appeal of the locations in which they are situated in order to accommodate such diversification in the actions and needs of foreign travelers is important.

Column

Global Power City Index

Global Power City Index 2015 was published, ranking Tokyo fourth. This index has been reported by the Institute for Urban Strategies of the Mori Memorial Foundation every year since 2008, evaluating 40 main cities in the world from the viewpoints of economy, culture, and environment under the concept that in the global-scale competition among cities, the “magnetic force” of a city attracting appealing and creative people and enterprises around the world as the comprehensive strength of the city.

Ranked at the top is London, second New York, and Tokyo comes in fourth for the eighth consecutive year following Paris in third. Although in first place in Asia, let's think about the strengths and weaknesses of Tokyo.

Looking to each category, one of the strengths of Tokyo is the economy, as Tokyo has maintained a ranking at the top in the world. Another is research and development where Tokyo is ranked second. In culture and exchanges, Tokyo moved up one notch to fifth due to the tendency for a depreciation of the yen, and the increases in foreign visitors and students studying in Tokyo from around 2012. Toward the Tokyo Olympics in 2020, the city is expected to attain a higher rank in this category.

As for the weaknesses, one is the environment where evaluations on the reduction of CO₂ emissions,

recycling, and renewable energies, are relatively low. Other weaknesses are transportation and access in which insufficient infrastructures link Japan and overseas, such as the small numbers of cities that are serviced by nonstop international flights from Tokyo, fewer international air passengers, and living conditions due to the higher average rent of residential houses and the price level, all of which lower the evaluation.

Japan has been selected as the No. 1 country in Asia that people most want to visit for the fourth consecutive year^{Note}, and Tokyo is regarded as especially popular among the regions. In order to strengthen the comprehensive force of this city, it is important to heighten its attractiveness as a city while understanding the strengths and weaknesses shown above.

Note Development Bank of Japan Inc. and Japan Travel Bureau Foundation [Survey on the intentions of inbound foreign tourists from eight regions across Asia (2015)]

Figure 3-1-21 Global Power City Index



Source) Institute for Urban Strategies of the Mori Memorial Foundation

(2) Initiatives and infrastructural elements to promote tourism to every corner of the country

(Developing a system of accepting tourists)

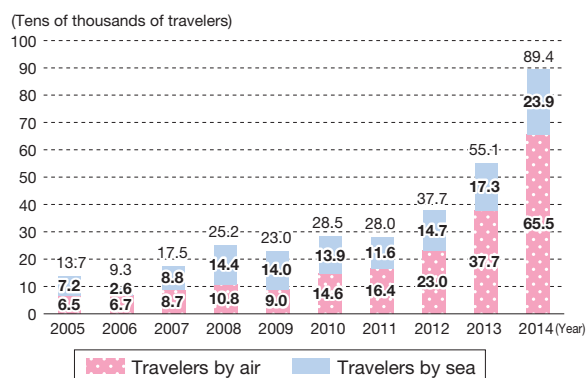
In order to accept increasing numbers of foreign travelers, ports of entry for arrivals by sea and air will need to be developed. Let us showcase areas that have integrated the revival of tourism with the development of infrastructure to incorporate demand for inbound tourism.

■ Naha Port and Naha Airport (Okinawa)

Okinawa is Japan's foremost prefecture of remote islands and comprises thirty-nine remote islands spread across a broad maritime area. Each remote island is blessed with extensive amounts of attractive tourism resources, including island culture and history, emerald-green seas, and white sandy beaches. These islands are visited by large numbers of domestic and overseas tourists. Approximately 890,000 foreign tourists, a record high figure, visited these islands in 2014 (Figure 3-1-22). Thanks to their proximity to Asia, these islands are a favored destination for many travelers from Taiwan and South Korea (Figure 3-1-23).

Figure 3-1-22

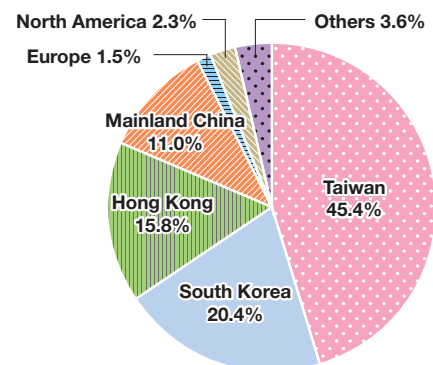
Changes in the number of foreign travelers visiting Okinawa



(Note) Does not include foreigners arriving via a domestic route.
Source) Developed by the MLIT based on Okinawa Prefecture's 2014 Tourism Catalog

Figure 3-1-23

Breakdown of foreign travelers by nationality (2014)



Source) Developed by the MLIT based on Okinawa Prefecture's 2014 Tourism Catalog

In Okinawa, tourism is regarded as a sector that acts as an engine for the prefectural economy. With a goal of receiving 10 million tourists (of whom 2 million shall consist of foreign tourists), the prefecture is engaged in the development of a system for accepting rapidly rising numbers of tourists and in the development of tourist facilities for these tourists.

At Naha Port, a port of entry for arrivals by sea, quays and cruise ship terminals were developed in order to accommodate increasing numbers of port calls by foreign vessels and the enlargement of vessels; these facilities began operations in April 2014. In addition to establishing screening booths and customs inspection stands at these facilities to receive foreign travelers, operators have also developed settings to allow visitors to obtain a sense of the local culture, such as by setting

up space where local traditional craftwork can be exhibited. With welcoming ceremonies being held and private hospitality initiatives being carried out whenever cruise ships call, 2015 saw a record number 105 port calls made by foreign cruise ships to smash the figure of sixty-eight such port calls made the preceding year (according to preliminary numbers).

A port of entry for arrivals by air, Naha Airport is a hub within Okinawa that is used by twenty-three domestic routes (exclusive of flights taking place only within the prefecture), ten international routes, and six routes linking Naha to remote islands within the prefecture (as of March 2016). Owing to increasing numbers of foreign travelers, the number of arriving international flights has been increasing since around FY 2010. In FY 2014, three new routes were added and the number of flights was increased for three existing routes. For this reason, construction work on second runway was commenced in January 2014 as part of efforts to expand the system for accepting foreign travelers (set to begin operating in March 2020).

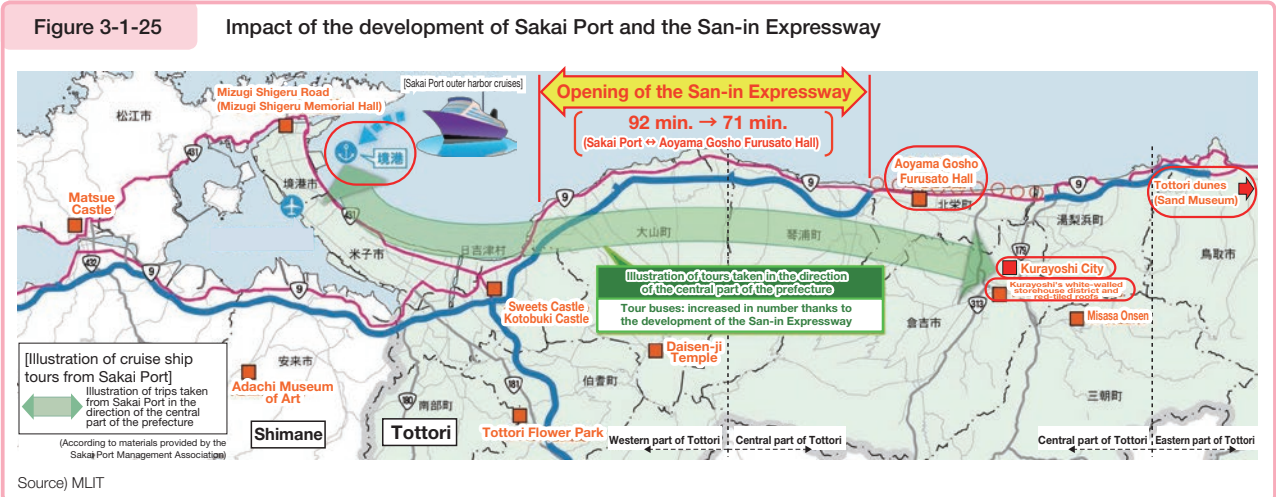
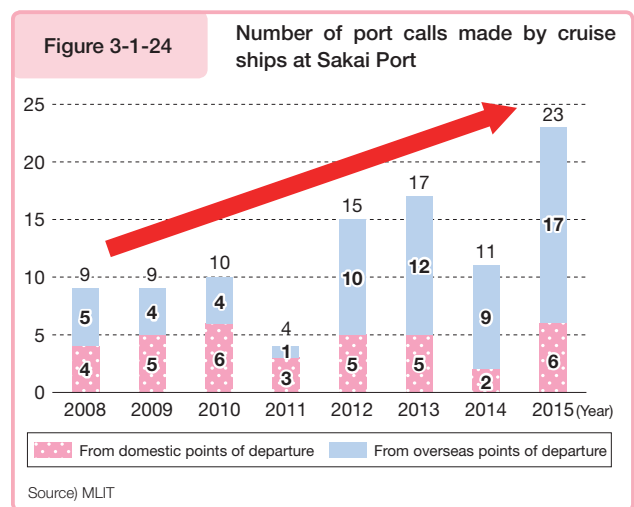
The revival of tourism is inextricably linked to the development of infrastructure in Okinawa, a prefecture surrounded on all sides by the sea.

■ Sakai Port (Tottori)

Sakai Port is situated in the San-in area, an area blessed by natural beauty and an ancient legacy of Japanese history and culture. It has long been a center of commerce as a port used for trade with the continent. To the rear stands Izumotaisha shrine and numerous other examples of historical sites, as well as hot springs and varied examples of tourism resources, including plenty that have been featured in works of manga and anime (such as *GeGeGe no Kitaro*). Sakai Port is expected to serve as an important node of local commerce.

At Sakai Port, the number of foreign travelers has been rising rapidly thanks to the launching of the operations of international ferries in 2009 and increasing numbers of port visits by large cruise ships (Figure 3-1-24). In order to accommodate further increases in the number of port visits by large cruise ships, work to develop the environment for accepting foreign travelers is proceeding. The Sakai Port Management Association is also holding workshops for administrative and tourism officials and business enterprises and other initiatives are being carried out through public-private partnerships in order to study ideal ways in which port functions should work for a site through which people and goods flow and measures for stimulating activities with the port as a hub for such activities.

The opening of the San-in Expressway has allowed the cruise-ship effect to spread across a wide area within the prefecture. With cruise passenger ship tours, options that enable travelers to visit a large number of spots in a short period of time on excursions that take no more than ninety minutes to complete before they have to head back to port are favored.



The number of tourist sites that can be accessed within a ninety-minute range has increased thanks to the opening of the San-in Expressway. Four tours that take passengers towards the central-eastern part of Tottori that had not existed in FY 2011 were planned in FY 2014.

Accordingly, it is expected that a system for accepting foreign travelers will be developed in and around Sakai Port and that a system for enabling spillover effects to spread throughout all areas of the prefecture will be established.

(Attractive travel proposals based on the use of infrastructure in various locations)

■ Setouchi Shimanami Kaido (Ehime and Hiroshima)

Setouchi Shimanami Kaido links Onomichi City in Hiroshima with Imabari City in Ehime through nine large and small islands in the Seto Inland Sea. Suspension bridges connecting these islands to one another also feature passageways that can be used by motorized bicycles and regular bicycles and are visited by cycling enthusiasts from overseas and across Japan.

Both prefectures are endeavoring to revive tourism through cycling and have developed many examples of bicycle-friendly infrastructure. Roads used for a main cycling course feature blue painted lines (known as the ‘blue line’) and destination signs to allow cyclists to arrive at their desired destinations without having to carry a map on their persons. Trains and buses that have been outfitted to enable bicycles to be transported by passengers have been developed and fees charged for carrying bicycles as levied on passengers riding vessels linking islands to one another have been kept low. In these and other ways, cyclists can travel freely with their bicycles and can choose to take any combination of various courses made available to them.

Peripheral facilities have also been developed, such that facilities from which visitors can rent bicycles and services for repairing bicycles in the event of an accident or breakdown can be found everywhere. Cycling stands have been set up by convenience stores and commercial establishments along routes as so-called ‘cycling oases’, facilities that give cyclists a change to interact with locals while maintaining their bicycles and replenishing supplies of water. In both Ehime and Hiroshima, ordinances have been amended to legalize the riding of two-person tandem bicycles on Shimanami Kaido and other general roads.

Figure 3-1-26 Setouchi Shimanami Kaido



Source) Ehime Local Promotion Association (left), Ehime Prefecture

The Honshu-Shikoku Bridge Expressway Company, with the cooperation of local private-sector companies, abolished bicycle tolls on the Setouchi Shimanami Kaido in July 2014 and organized Cycling Shimanami, an international cycling meet, in October of the same year in hopes of further promoting cycling in the area (Figure 3-1-27). This event was attended by 7,281 participants from overseas and across Japan thanks to awareness of the fact that this was the only expressway in Japan in operation that permits cyclists to use it and to the establishment of ten different types of courses for their benefit. Five hundred and twenty-five participants from thirty-one different countries and regions also attended. This event helped generate economic effects amounting to approximately JPY 1,500 million in both Ehime and Hiroshima ^{Note 65}. Through such initiatives, forty-two percent more rental bicycles were used on the Setouchi Shimanami

Note 65 Stated in materials provided by Ehime.

Kaido in FY 2014 than in the preceding year (Figure 3-1-28). Even in areas surrounding the Setouchi Shimanami Kaido, demand for tourism and accommodation facilities is on the rise, the economic effects of which are gradually spreading.

In Ehime, efforts are also being made to popularize cycling across all of Shikoku, such that tourism is expected to undergo a revival through the continued use of local scenic attractions and infrastructure.

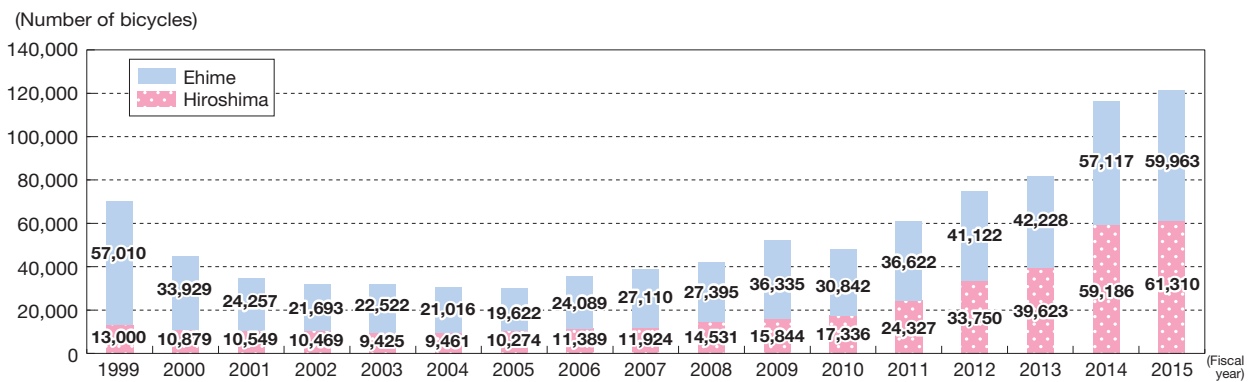
Figure 3-1-27

Cycling Shimanami, an international cycling meet



Source) Ehime Prefecture

Figure 3-1-28 Use of rental bicycles on the Setouchi Shimanami Kaido



(Note) Figures for FY 2015 correspond to an eleven-month period that ended in February 2016.
Source) Ehime Prefecture

Column

Utilization of dams as tourist resources for regional revitalization ~dam tourism~

In recent years, more attention has been paid to the effectiveness of dams as tourist resources. The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) is promoting dam tourism to guide sightseers through dam sites as a part of a tour in cooperation with private travel agencies. At some dam sites, some twists are added to tours, such as visiting a dam site under construction and seeing extra-large construction machines, entering the inside of a dam, which is usually forbidden, and experiencing in person the impact of discharges or the scale of a dam. (Figure 3-1-29).

While creating and distributing Dam cards in 460 dam sites around the nation, MLIT also have prepared a pamphlet “Damu wo mini iko (Let’s go to see dams)” quarterly, and now is posting them on the website. At the same time, in the regions of water resources, efforts to create souvenirs associated with the dams, such as

Figure 3-1-29 Sites where ideas for guidance have been fully worked out

<Oitagawa Dam: Dam Safari Park>

<Naramata Dam: discharging of water for inspection purposes>



Source) MLIT

Dam Curry, etc. (Website for reference http://www.mlit.go.jp/river/dam/dam_tourism.html).

Figure 3-1-30 *Damu wo mini iko* (Let's go to see dams), a series of pamphlets promoting dam tourism



Source) MLIT

Figure 3-1-31 Dam cards and Dam Curry

<Miyagase Dam>



Source) MLIT

<Tsugaru Dam>



■ Boat tours on the Sumida River (Tokyo)

Triggered in part by the approach of the Tokyo Olympic Games in 2020, efforts to revive tourism through the use of rivers (cruise tourism) have come to garner attention in recent years. Flowing through Tokyo, the Sumida River is regarded as having considerable potential in this sense in that it is surrounded by plenty of tourist spots that are highly popular among foreign travelers, namely Tokyo Station, Ginza, Tsukiji, Akihabara, and Asakusa. However, since both banks of the Sumida River largely feature high levees that were built for disaster-prevention purposes, this river could not previously be described as being appealing in terms of scenic attractions since only some of the cityscape could be seen from a vessel traveling on this river.

In this connection, Tokyo Cruise Ship Co., Ltd, an operator of water buses on the Sumida River, studied the idea of converting vessels themselves into a source of amusement and proceeded to introduce the HIMICO and HOTALUNA, a pair of passenger ships produced by Leiji Matsumoto, a manga artist renowned for such works as *Ginga Tetsudo 999* (Figure 3-1-32). The unique shapes of both passenger ships have drawn attention from people overseas and across Japan. The wide windows and glass-paneled roofs allow passengers to glance up at the bridges spanning the Sumida River from positions directly below these bridges as they pass underneath. Having also been featured in European media, these ships have been visited by anime fans from Europe and other foreign travelers.

The Metropolis of Tokyo is engaged in efforts to expand the use of waterways. From November to December 2015, multiple free waterway tours were held for the benefit of residents and tour operators in collaboration with Sumida-ku, Ota-ku, ship operators, and other concerned parties. As concerns international conferences and other examples of MICE ^{Note 66}, companies that organize such events have been invited to consider options in the area by being given tours of exhibition sites and commercial facilities alongside Tokyo Bay from vantage points on the water. The construction of new disaster-purpose wharfs and the expansion of efforts to open them up for private-sector operators are being studied. The continued promotion of tourism based on the use of rivers is expected.

In promoting inbound tourism as outlined above, the development of a system for accepting foreign travelers and initiatives for inducing them to travel to regional destinations are important. It is also important to harness various types of infrastructural elements constituting regional resources to draw the diversifying interests of inbound travelers.

Figure 3-1-32

HOTALUNA water bus



Source) Tokyo Cruise Ship Co., Ltd

Note 66 MICE is an acronym that collectively refers to corporate meetings (meetings), corporate incentives and training trips (incentives), international conferences (conventions), and exhibitions and events (exhibitions/events).

Column

Full enjoyment of the attractiveness in waterfronts while traveling from Haneda to the city center comfortably and waveringly by ship

For the purpose of transmitting the attractiveness of waterfronts in Tokyo, around the world, MLIT carried out social experiments of transportation by ship that links Haneda Airport and Akihabara in September 2015.

This is the first sea route from the airport to the city center. Into this route, the attractiveness of waterfronts in Edo and Tokyo is condensed: the atmosphere of Edo, such as houseboats and inns for sailors, and historic bridges constructed about 90 years ago, and new waterfronts in Tokyo.

In the social experiment in September, although the cost of a one-way ticket for a two-and-half-hour trip between Haneda and Akihabara was about 3,000 yen, not inexpensive, the tickets were almost sold out on the first day, and a total of approximately 1,500 passengers (the load factor was 93%) enjoyed the voyage over the seven-day period. This experiment showed that sufficient profitability and demand could be prospected, and thus, in 2016, another social experiment is underway in expectation of several tens of thousands of participants ^{Note}.

For this experiment, the private sector side has built a new ship *Jetsailor*, and many local private enterprises, such as Tokyo Dome Corporation and Mansei Co., Ltd., have been involved as local supporters, fostering momentum for transportation by ship. Ships are now under operation between Yokohama, Haneda and central Tokyo, carrying a passion to convey the attractiveness of waterfronts in Tokyo. It is expected that the experiment will be successful and the transportation by ship will become regular services.

Figure 3-1-33 Vessels that have been operated since May 2016 to test the idea of developing a water transportation-based society

Jet Sailor, a new vessel (KMC Corporation)



Ruku (Zeal)



Sky Hope (Tokyo Waterways)



Dream (Funasei)



Tamonmaru (Galleon)



Source) MLIT

Note Website for reference: http://www.mlit.go.jp/sogoseisaku/region/sogoseisaku_region_tk_000022.html

Section 2

Securing Leaders for the Development of Infrastructures, Improving On-site Productivity, and Adopting New Technologies

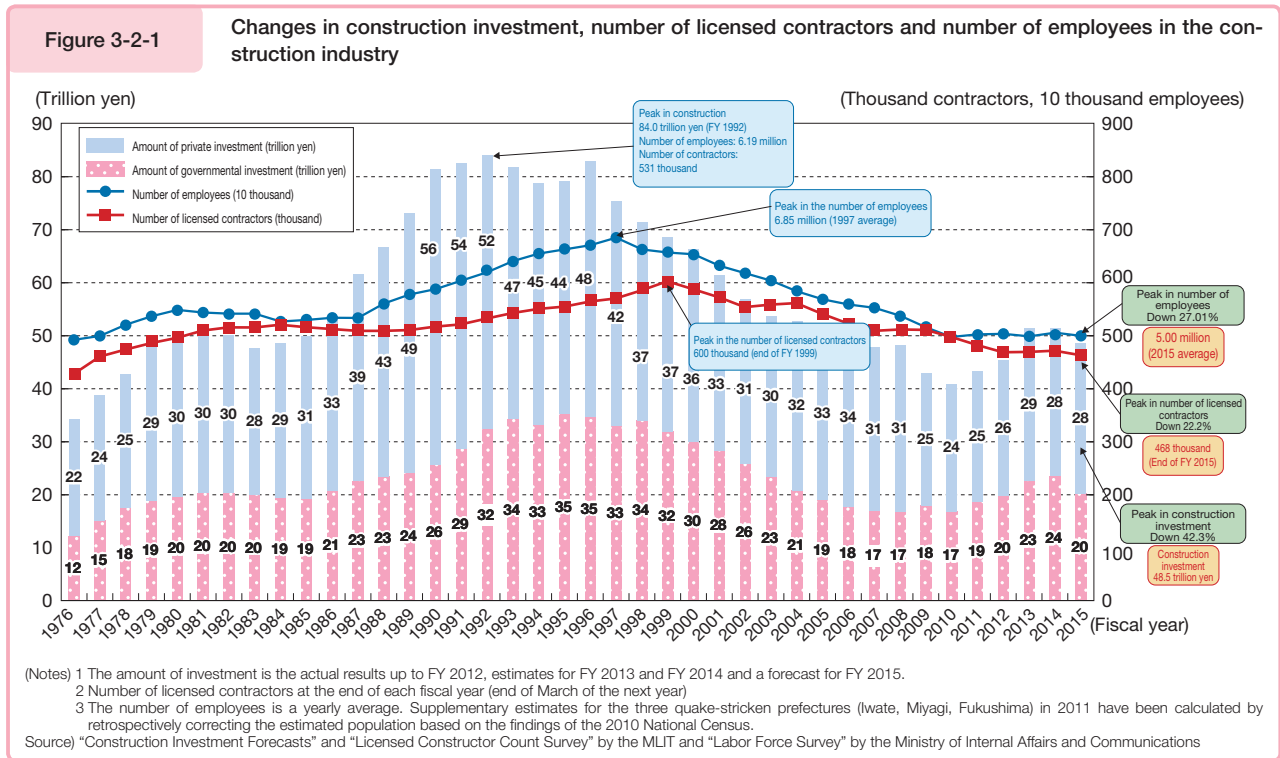
1 Securing leaders for the development and maintenance of infrastructures

(1) Status of the labor force in the construction industry

(Current state of the construction industries)

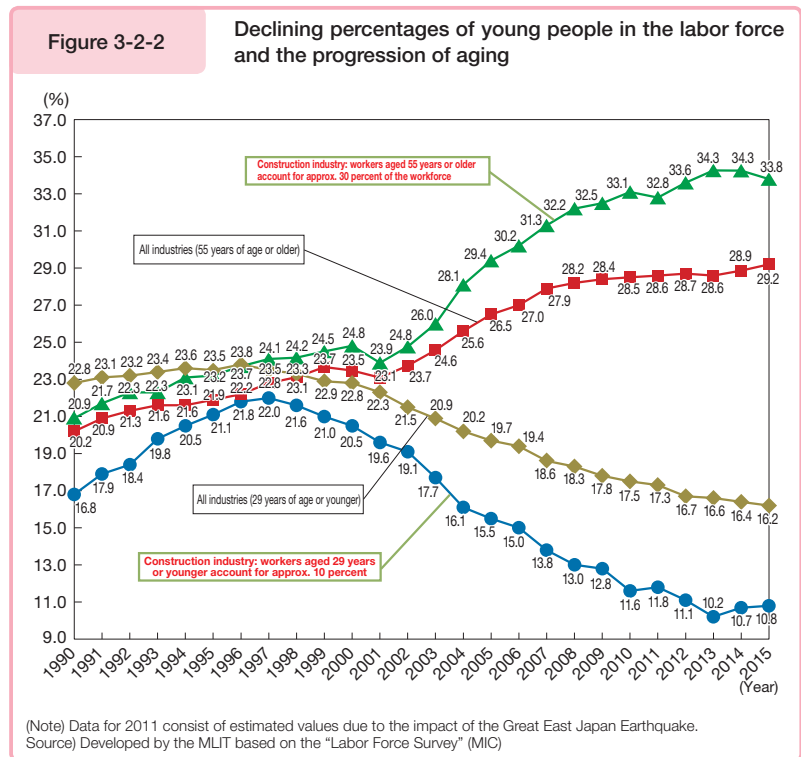
In order to continue to endeavor to ensure the quality and maintain the appropriate functionality of infrastructure amid projections of shrinkage in the working age population for all of Japan, it is important that we smoothly secure leaders for

this purpose. However, construction investment peaked in 1992 and the number of employees peaked in 1997 before declining in the years up to 2010 (Figure 3-2-1).



(Shrinking pool of young workers joining the work force and an aging population)

Local construction companies are suffering in terms of their management environment thanks to deficit orders attributable to excessively low bids and are facing numerous problems, including declining wages for skilled workers and a shrinking pool of young workers joining the labor force. If we break down workers in the construction industry by age bracket, we see that those aged fifty-five years or older account for approximately thirty percent of all workers while young workers aged twenty-nine years or younger account for approximately ten percent of all workers. In contrast to the overall situation for all industries, workers are aging at a greater pace and the ratio of young workers to the total work force is declining more rapidly in the construction industry (Figure 3-2-2).



(Initiatives through public-private partnerships)

In light of the need to start studying measures that should be taken across both short-term and medium- to longer-term timelines by fostering a shared awareness of the current situation surrounding leaders of the construction industries and of future perspectives and other important issues, meetings of the Construction Industry Revitalization Council as chaired by the State Minister of Land, Infrastructure, Transport and Tourism were held in January 2014. This council has engaged in various forms of initiatives as comprehensive measures to secure and foster human resources through public-private partnerships. Examples include the implementation of measures to limit principal contractors and certain primary sub-contractors for government construction projects to businesses enrolled in social insurance schemes and the formulation of a construction industry action plan to enable women to play a bigger role in August of the same year and the launch of a consortium to secure and foster leaders of the construction industries (secretariat: Construction Business Promotion Fund) in October of the same year (Figure 3-2-3).

In conjunction with these initiatives, construction industry groups have been steadily carrying out various initiatives in accordance with their salient features. Examples include the formulation of Action Guidelines for Securing and Cultivating Future Local Construction Industry Leaders by the National Construction Industry Association (February 2015) and the formulation of a Long-Term Vision for the Construction Industry With a View to Revitalization and Evolution by the Japan Federation of Construction Contractors (March of the same year).

Thanks to these sorts of public-private initiatives, the number of skilled workers has stayed firm in recent years to keep pace with the stability of public investments^{Note 67} (Figure 3-2-4).

Figure 3-2-3

Consortium to secure and foster leaders of the construction industries

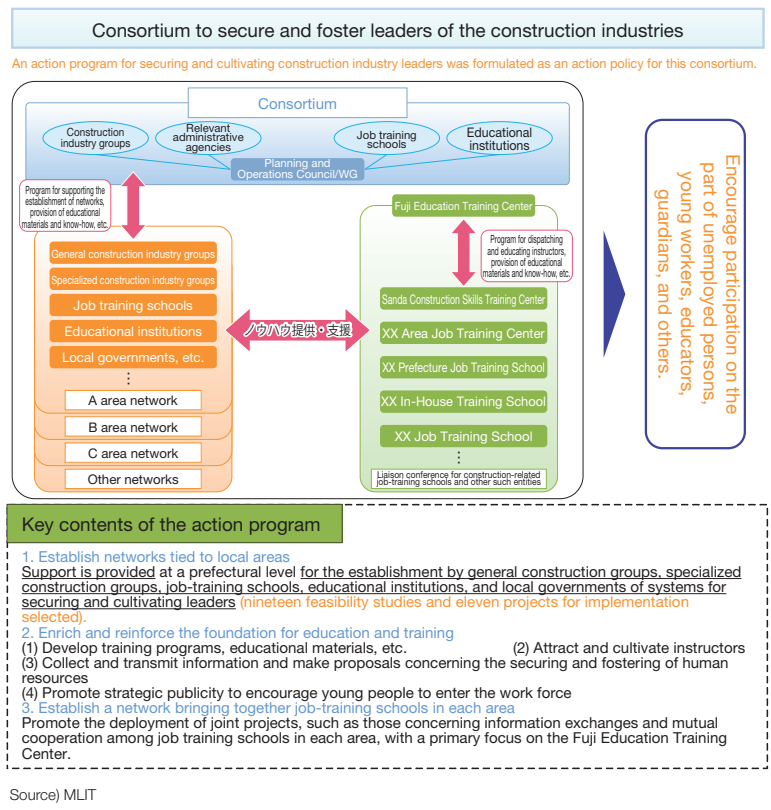
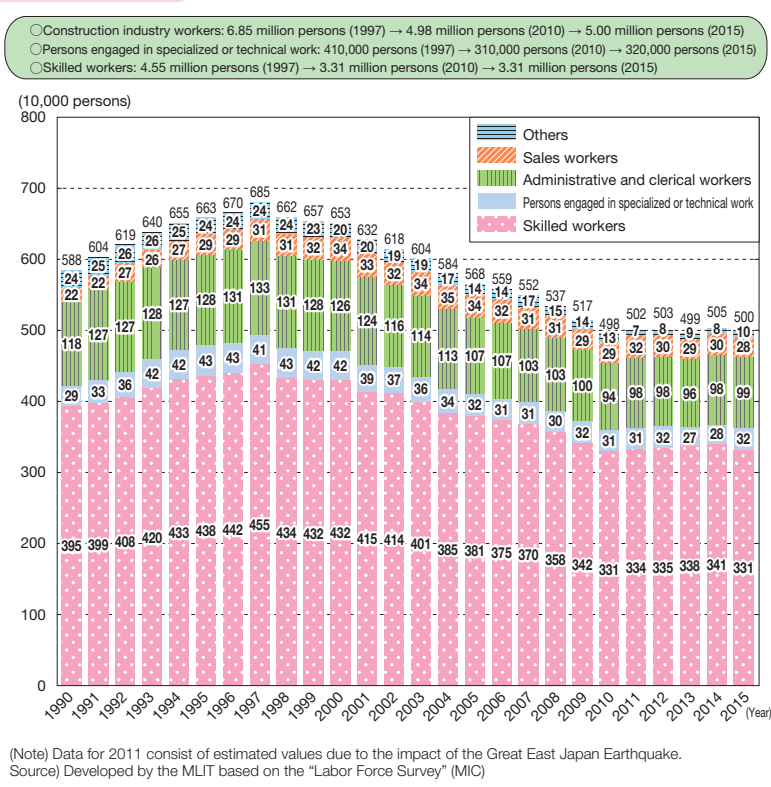


Figure 3-2-4

Changes in the number of construction industry workers



Note 67 As indicated in Figure 3-2-1, government construction investments remained stable between FY 2010 and FY 2014.

However, it is expected that skilled workers will leave the construction business in droves due to aging and other factors. The most important issues to address in order to maintain the quality and appropriate functionality of infrastructure will be the promotion of efforts to attract and keep young people to take over the future of the construction industry and the securing of human resources. From this perspective, an agreement between public and private entities to take on the task of securing future leaders with resolute determination by endeavoring to further reinforce measures to secure and cultivate leaders with a focus on improving job conditions and by improving productivity within the framework of the construction production system through public-private partnerships was reached at the tenth meeting of the Construction Industry Revitalization Council held in May 2015.

(2) Making thorough improvements to working conditions

Declining wages (low earnings) is conceivably a factor behind the shrinkage in the construction industry workforce. If we look at the trend in the recurring profit margin of the construction industry, we can see that the profitability of construction industry was higher than the average of all industries combined in the first half of the 1990's. However, since the economic bubble burst, the declining trend has continued, and since 2000's has remained at a low level in the 1% range. Since FY2011, it has started to recover due to the reconstruction demand, but still remains below the profit rate of the manufacturing industry and of all the industries combined (Figure 3-2-5).

In regards to the wage of skilled workers, if we look at the trend in the total annual wage amount paid to male production workers in the construction industry, there is a large increase continuing into the first half of the 1990's, and the difference between their wage and that of male production workers in the manufacturing industry shrank significantly. However, since then the wage of the construction industry started to decrease, the difference has again widened (Figure 3-2-6).

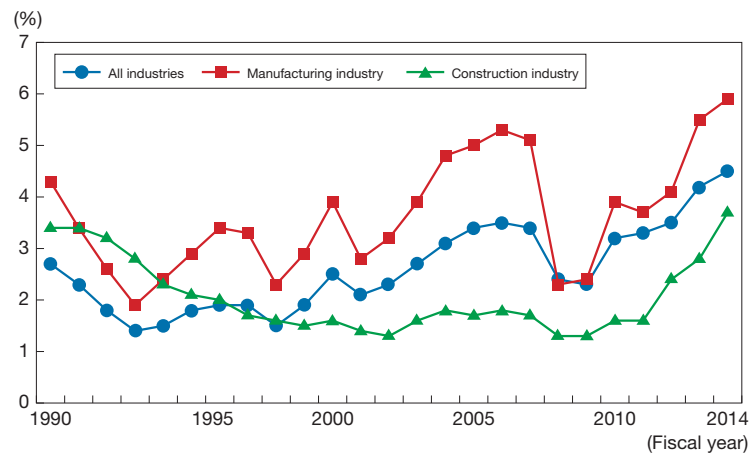
The fact that an environment for social insurance and other welfare programs has not been developed and the fact that improvements in job conditions have otherwise lagged behind those of other

industries are key factors behind the loss of highly skilled workers and the difficulties young people have in finding and keeping work in the construction industry. It is essential that efforts be undertaken to thoroughly improve working conditions if we are to secure leaders in this industry. To this end, the MLIT is carrying out the following initiatives:

(Promoting the appropriate payment of wages and enrolment in social insurance schemes)

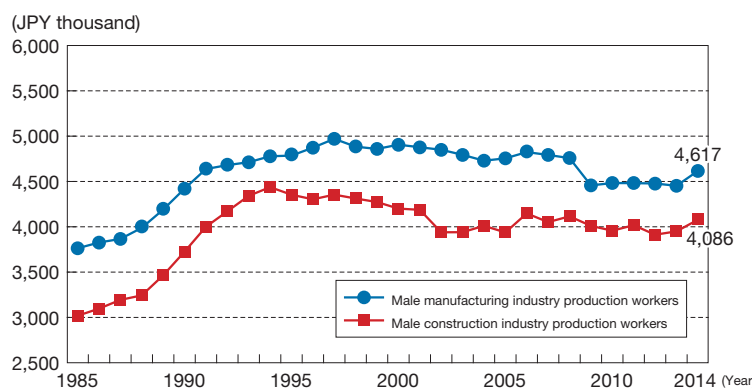
In order to secure appropriate wage levels for on-site workers, a fourth round of increases in the unit price of labor for

Figure 3-2-5 Changes in the Recurring Profit Margins of the Construction Industry



Source) Developed by the MLIT Ministry of Finance "Corporate Annual Report of Statistics"

Figure 3-2-6 Changes in Total Annual Wages



(Notes) 1 Annual wages = set amount of cash salary x 12 + annual bonuses and other special salary
 Set amount of cash salary= amount of cash salary paid for June (amount before deducting income tax, social insurance fees, etc.), and includes base salary, duty allowance, perfect attendance allowance, travel allowance, family allowance, overtime etc.
 Annual bonuses and other special salary = any bonuses paid out between January and December of the year previous to survey year, special salary like year-end allowance, etc.
 2 Production workers refers to workers engaged in the production of goods being carried out mainly at work sites (construction site, etc.)
 3 Survey conducted on private establishments that employ over 10 permanent workers.
 Source) Developed from Ministry of Health, Labour, and Welfare "Basic Survey on Wage Structure"

public works and design jobs was carried out based on actual conditions in February 2016. Efforts will be made to link such increases in the unit price of design labor to a virtuous cycle in terms of increases in the wage levels of on-site skilled workers.

Measures to attain 100 percent enrolment in social insurance schemes on the part of licensed contractors at an enterprise level by FY 2017 have been implemented. Steady results have been achieved, such as in terms of a fifteen percent increase in the rate of enrolment in three insurance schemes ^{Note 68} by workers over a four-year period from 2011 to 2015 (Figure 3-2-7).

In order to further reinforce initiatives, briefings to publicize measures to address non-enrolment (“caravan” sessions) were held at ten locations nationwide and actions to promote social-insurance enrolment were accelerated ^{Note 69}.

In addition, a public-private consortium was established in August 2015 with the aim of setting up a construction career-advancement system through which information concerning the skills and experience of skilled construction workers is accumulated according to standard rules, appropriate evaluations are performed and improvements in job conditions are granted in accordance with skills and experience, the level of construction quality is improved, and on-site efficiency is achieved (Figure 3-2-8). In April 2016, a second meeting of this public-private consortium was held in hopes of establishing a career-advancement system, with the result that a basic plan was drafted.

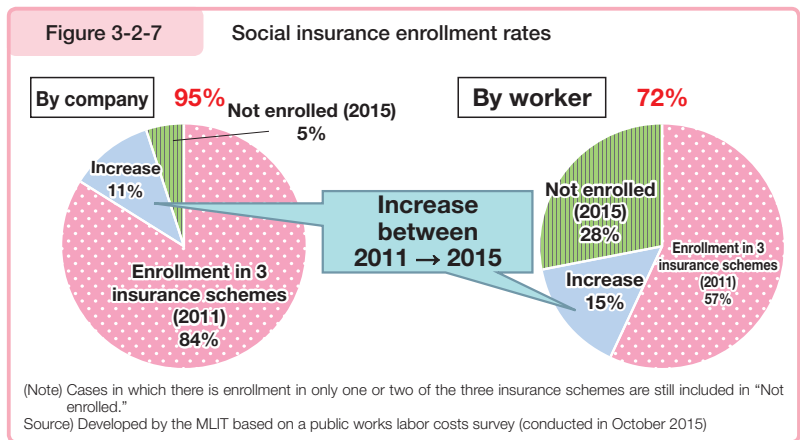
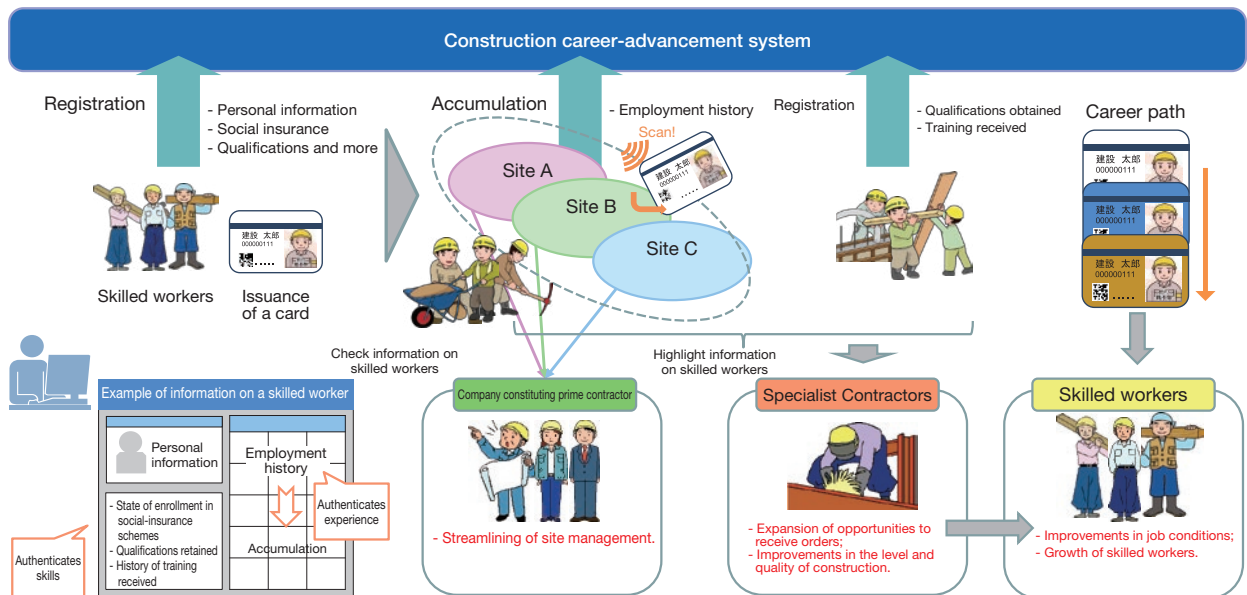


Figure 3-2-8 Construction career-advancement system

- Studies will be carried out through public-private collaborations with a view to establishing a career-advancement system to induce improvements in job conditions for skilled workers.
- The establishment of this system will enable the realization of the following: (i) improvements in job conditions based on an appropriate evaluation of a skill worker’s skills and experience, (ii) the efficient allocation of human resources according to skills and experience.
- Applications for registration will begin to be accepted in April 2017 with a view to commencing full-scale operations in August 2017.



Note 68 Employment insurance premiums, health insurance premiums, and welfare pension insurance premiums.

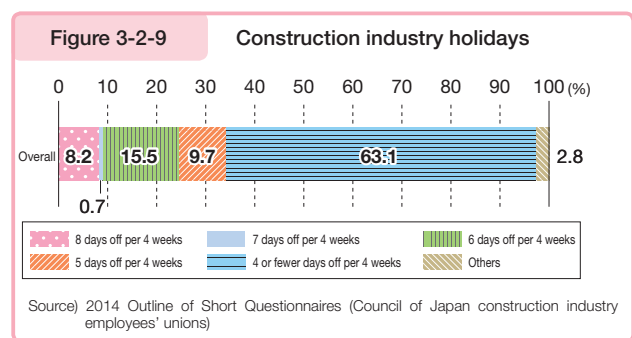
Note 69 Guidance provided when licenses are renewed was provided on an accelerated basis prior to the deadline for license renewal to licensed operators whose licenses were set to expire in or after January 2016.

(Reinforcing anti-dumping measures and eliminating actions that unlawfully undercut target prices)

Initiatives to reinforce anti-dumping measures and eliminate actions that unlawfully undercut target prices ^{Note 70} are being implemented in accordance with the amended Act on Promoting Quality Assurance in Public Works (amended Quality Assurance Act), which came into full force in April 2015, the amended Construction Business Act, and the amended Act for Promoting Proper Tendering and Contracting for Public Works (amended Tendering and Contracting Act). With respect to the elimination of actions that unlawfully undercut target prices in particular, surveys on actual conditions and on the reasons why actions that unlawfully undercut target prices are carried out have been administered to local governments four times to date in collaboration with the Ministry of Internal Affairs and Communications. Local governments engaged in this practice have been asked to reexamine their stance as soon as possible through various opportunities. Consequently, all (459) local governments engaged in this practice as of January 2015 as a matter of convention or for the soundness of fiscal administration at a local-government level agreed to abolish it as of April 2016.

(Increasing the number of holidays in the construction industry (to realize two days off each week))

One factor that can explain why young people choose not to find and keep jobs in the construction industry is the lack of holidays. According to a survey on shorter working hours as conducted by the Council of Japan Construction Industry Employees' Unions, approximately sixty percent of construction worksites incorporate schedules that offer no more than four holidays every four weeks (Figure 3-2-9). Efforts to improve on-site working conditions to enable workers to take two days off a week after setting up an appropriate schedule by taking into account the nature of



the construction project in question, local conditions, natural conditions, the number of days on which construction work will not be performed due to the conferring of holidays on construction workers, and other factors will be needed.

Since FY 2014, the MLIT has been carrying out model construction projects that provide workers with two days off a week. In FY 2015, initiatives were carried out through public-private partnerships to secure two days off a week for fifty-six construction projects.

Issues have been ascertained through model construction projects and solutions are being studied with a view to securing two days off a week as stated in the guidelines on the amended Quality Assurance Act, which called for securing and cultivating leaders.

(3) Securing prospects for a stable, sustainable construction industry

Rapid increases and decreases in public investment amounts in the past gave rise to various adverse effects, including the emergence of non-conforming operations in the construction industry, frequent occurrences of dumping, and loss of human resources. With significant reductions in public investment, the environment surrounding the management of Japanese construction companies is worsening, the pool of young workers is shrinking, the workforce is aging, and other structural issues are arising. In recent years, wage levels have recovered along with a recovery in public investment amounts and the size of the skilled workforce has also remained somewhat firm. Nevertheless, it will be necessary to engage in the development of an environment that will allow construction business operators to believe that future prospects, such as in terms of a sustainable, reliable flow of public works funding, are bright in order to secure leaders who will bolster the future development of infrastructure.

Note 70 Refers to actions to set predetermined prices by deducting part of the amount indicated in written design specifications that have been drafted in accordance with a correct estimate. These actions are not to be carried out given that they contravene the provisions of paragraph (1)(i) of Article 7 of the amended Quality Assurance Act, predetermined prices are meant to be prescribed by taking example prices of transactions into account based on the Cabinet Order concerning Budgets, Auditing and Accounting and Financial Regulations and Rules, and there is a risk that the securing of the quality of public works and the safety of construction will be compromised and that the sound growth of the construction industry will be impeded.

(4) Giving young people and women more opportunities to participate

(Promoting earlier participation on the part of young people and enhancing education and training for young people)

As the workforce ages, the development of an environment to get young people to find jobs with the specific aim of working in the construction industry and encourage them to keep these jobs going forward is a pressing issue. Specifically, we will work on significantly expanding the requirements for undergoing technical qualifications testing, expanding the scope of institutions subject to briefings ('caravan' sessions) from industrial high schools to primary and junior high schools and regular academic high schools, continuing the provision of support for the establishment of an education and training scheme by locally connected networks, and developing programs and educational materials required for education and training.

According to a questionnaire-based survey administered to children (by Kuraray), the percentage of boys entering the first year of primary school who indicate "carpenter or craftsman" for their preferred future career has remained more or less constant, such that these occupations consistently rank in the top ten among all job categories (Figure 3-2-10).

Figure 3-2-10 Future Dream Occupation Survey (Boys)

		(%)									
		2011		2012		2013		2014		2015	
1	Athlete	(29.8)	Athlete	(26.7)	Athlete	(27.2)	Athlete	(22.6)	Athlete	(26.1)	
2	Firefighter/rescue team member	(6.8)	Police officer	(8.2)	Police officer	(9.6)	Police officer	(10.9)	Police officer	(11.4)	
3	Police officer	(6.3)	Driver	(7.8)	TV/anime character	(7.0)	Driver	(7.7)	Driver	(7.8)	
4	Driver	(6.0)	Firefighter/rescue team member	(7.0)	Driver	(6.2)	TV/anime character	(6.7)	Firefighter/rescue team member	(5.9)	
5	Chef	(4.6)	TV/anime character	(6.3)	Firefighter/rescue team member	(6.0)	Firefighter/rescue team member	(5.7)	TV/anime character	(4.7)	
6	Patisserie/baker	(4.2)	Carpenter/craftsperson	(4.2)	Carpenter/craftsperson	(4.4)	Patisserie/baker	(5.0)	Carpenter/craftsperson	(4.4)	
7	Carpenter/craftsperson	(3.8)	Chef	(3.2)	Patisserie/baker	(3.5)	Pilot	(3.5)	Patisserie/baker	(3.7)	
8	Researcher	(3.7)	Patisserie/baker	(3.1)	Medical doctor	(3.0)	Medical doctor	(3.3)	Medical doctor	(3.4)	
9	Entertainer	(3.5)	Researcher	(3.1)	Chef	(2.8)	Carpenter/craftsperson	(3.1)	Pilot	(3.1)	
10	TV/anime character	(3.4)	Self-employed (—)	(3.0)	Researcher	(2.7)	Researcher	(2.8)	Researcher	(2.5)	

(Note) This survey was administered to children attending primary school.

Source) Developed by the MLIT based on Kuraray's "Desired occupations as indicated by newly enrolled first-year primary school students."

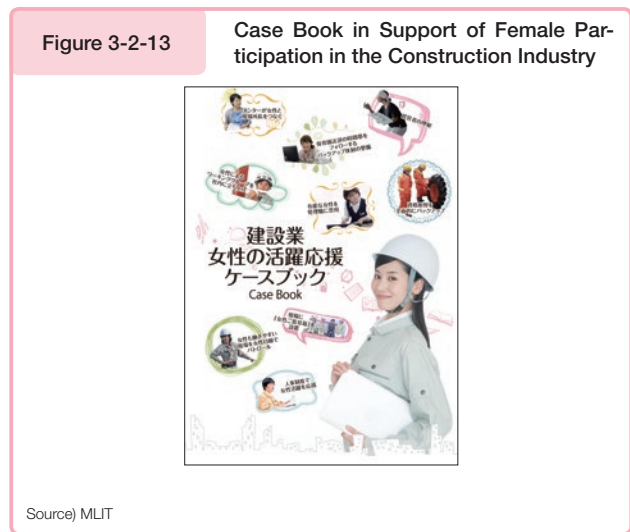
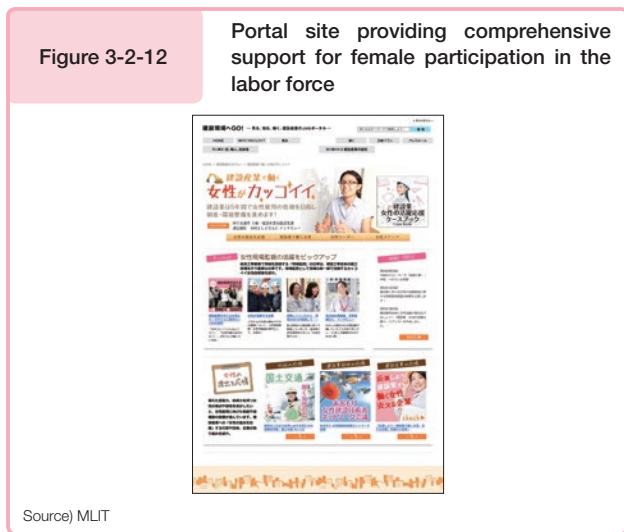
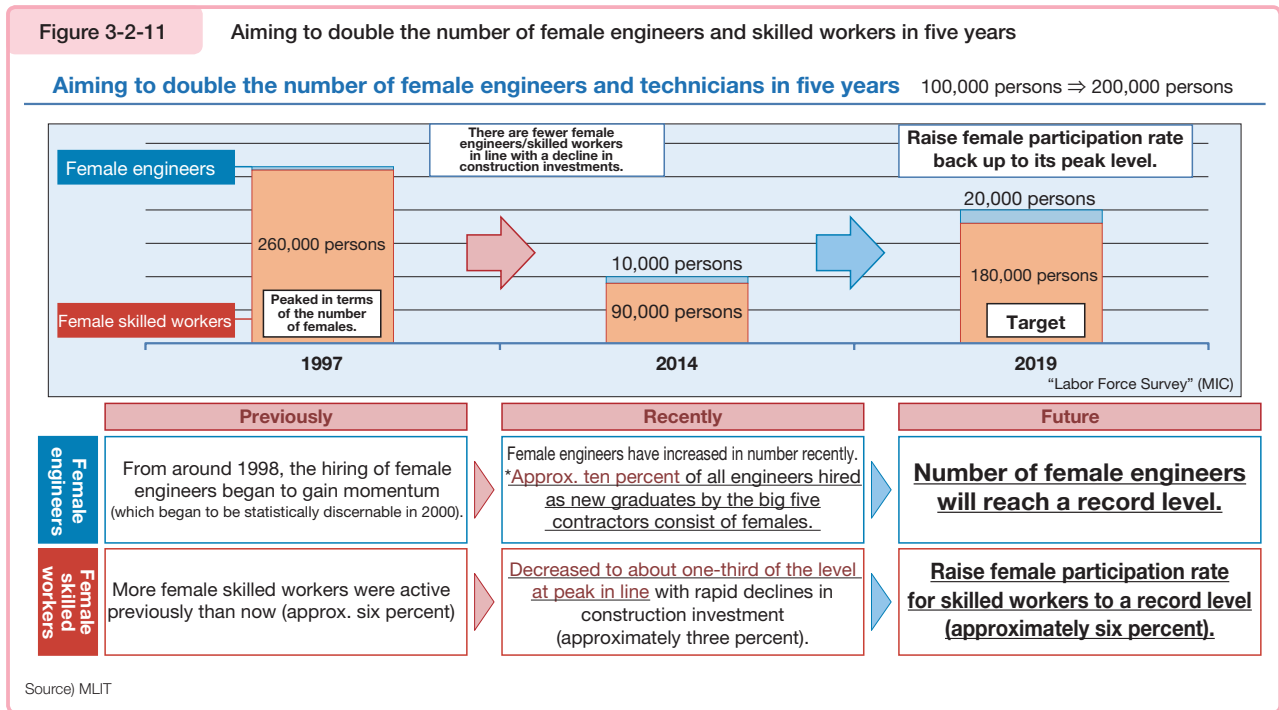
For boys entering primary school, the construction industry is regarded as an attractive industry (occupation). Transmitting that appeal to them so that they will continue to be interested in a construction profession could become a factor in increasing the number of young people entering this profession. For this reason, we need to continue to work on forming young people's motivation for occupation choice, and promote the occupation by having skilled workers conduct visiting lectures for students that tells them about the fun and joy in creating things, by holding construction site tours, and by giving on-site training.

(Promoting greater participation on the part of women in the construction industry)

Aiming to increase the number of women engineers and skilled workers two-fold in five years (Figure 3-2-11), the MLIT has been elevating opportunities for female participation by pursuing specific initiatives prompted by an action plan to enable greater female participation in the construction industry as formulated jointly by public and private entities in August 2014. Examples of such initiatives include support for programs to promote female participation with community involvement, the steady implementation of model construction projects to advance the recruitment of female engineers and construction projects undertaken on a trial basis to establish quality washroom facilities at construction sites, the production of compilations of case studies involving the provisional establishment of washroom facilities at construction sites, and the launching of a portal site ("Women working in the construction industry are cool") to comprehensively back female participation (Figure 3-2-12). Specifically, we are at the stage where we seek to change the workplace in order to facilitate more participation and involvement by women in the construction industries.

In FY 2015, progressive cases in support of female participation were collected, a case book in support of female participation in the construction industry was produced according to theme (Figure 3-2-13), and the first questionnaire-

based survey on the actual state of and opinions regarding initiatives concerning female participation was conducted as examples of new initiatives undertaken to promote greater participation on the part of women in the construction industry.



Column **Expectation for KidZania to develop people who shoulder responsibilities for the future**

“KidZania”, a facility originated in Mexico, where children can experience various jobs in society, now enjoys high popularity.

In Japan, there are two KidZanias, “KidZania Tokyo” (Koto City, Tokyo) opened in October 2006, and “KidZania Koshien” (Nishinomiya City, Hyogo) opened in March 2009, both are targeted for children ages 3 to 15 with the concept of edutainment combining education and entertainment.

Although the facility is for children to experience jobs in society, the contents are realistic, and about 100 kinds of jobs and services are in place. Each job or service is sponsored by a major company that supervises

the activity (job or service to be experienced) and provides uniforms, technical tools, and equipment.

The activities offer experiences, for example, as a driver in operating a subway train, as a train maintenance or track workman in doing the work, and as a carpenter at a house construction site in building a house that can satisfy a customer's requests while cooperating with other people (Figure 3-2-14 and 3-2-15).

KidZania serves as a valuable space providing opportunities for children to learn the meaning of work, the fulfillment and value of money, and think of their futures.

While the population decline and the decreasing productive-age population are topics, and the shortage of the workforce is an issue, various regions around the nation are implementing programs to experience jobs specific to each region as a local version of KidZania.

It is hoped that children will deepen their interest in and concern about jobs through such experiences of manufacturing and commerce and become bearers of the future.

Figure 3-2-14 Children replacing rails as track workers using specialized equipment and tools



Source) KCJ GROUP

Figure 3-2-15 Child engaged in exterior wall work as a carpenter



Source) KCJ GROUP

(5) Creating a maintenance industries

As stated in chapter 1, Japanese social infrastructures was intensively developed during the period of high economic growth. There is concern that such elements of social infrastructures will rapidly degenerate in the years to come. The maintenance and renewal of social infrastructures are a huge issue for the entire country, such that these matters concern not just the national government but also the local governments that manage a considerable portion of the social infrastructures that is in existence today.

Over the next twenty years, it is projected that the percentage of facilities that are fifty years of age or older will rise on an accelerated basis ^{Note 71}, such that it is hoped that we can strategically maintain infrastructure that is set to become superannuated en masse. For this reason, it is important that we conduct systematic inspections and repairs and steadily provide financial and technical support to local governments in accordance with a plan for extending the service life of infrastructure and help to cultivate and stimulate the maintenance industries.

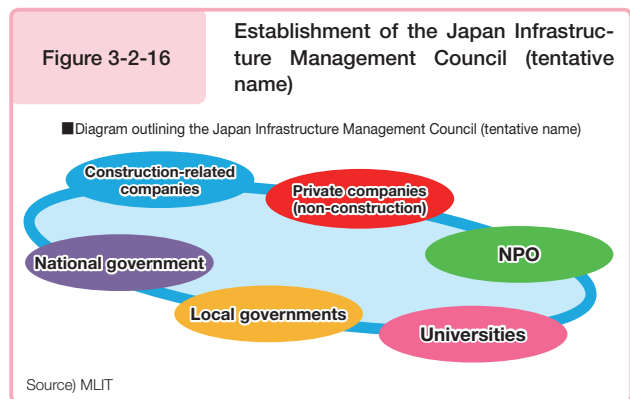
With the Sasago Tunnel ceiling board fall accident in December 2012 acting as a major catalyst for change, initiatives are being undertaken within Japan with interest in the maintenance of infrastructure expressed by a wide range of industries. The size of the domestic market is expected to grow. The MLIT will proactively engage in the following measures:

Note 71 Costs of maintaining and renewal social capital and the state of superannuation as outlined in chapter 1 (Figure 1-2-45).

(i) Establishing Japan Infrastructure Management Council (tentative name)

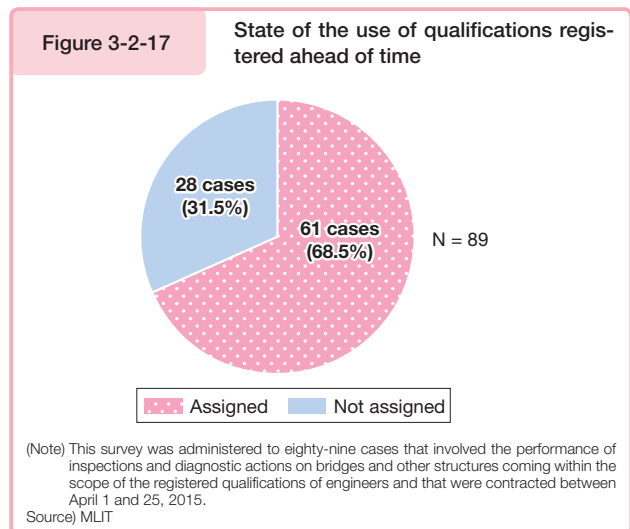
The MLIT has determined that Japan Infrastructure Management Council (tentative name) shall be established in FY 2016 as a platform to allow industrial, academic, and governmental parties to collectively engage in full-scale efforts in order to disseminate a maintenance mindset and cultivate and stimulate the maintenance industry (Figure 3-2-16).

At a meeting held at the end of 2015 where companies and organizations interested in the maintenance of infrastructure could exchange opinions, technology was shared with officials from other industrial sectors, new business models were investigated, and various opinions calling for the establishment of an awards program and other such measures were exchanged. Accordingly, we would like to see the discovery of new private-sector technologies and the entry of new participants from a broad range of industrial sectors promoted through the establishment by the National Council of a framework for the provision of support to accompany initiatives undertaken by companies and organizations.



(ii) Harnessing a system for registering private-sector qualifications for fostering and securing maintenance engineers

By evaluation existing private qualifications and harnessing a system for registering qualifications that satisfy technical standards required for maintenance, we can promote the cultivation and utilization of private-sector engineers and ensure the quality of inspections, diagnostic actions, and other such operations. Registered engineers were allocated for approximately seventy percent of inspections and diagnostic actions involved in early-order placements made in FY 2015 (Figure 3-2-17).



(iii) Promoting the spread of and providing education on good practices

In order to promote the spread of and provide education on the philosophy of infrastructure maintenance, the MLIT called for the submission of case examples of ideas and good practices supporting the maintenance and renewal of infrastructure and held panel exhibitions on good practices for the maintenance of infrastructure for approximately one month beginning in December 2015. This information has been posted to an information portal site ^{Note 72} (Figure 3-2-18). Visitors to this information portal site can check the status of infrastructure inspections in different areas, including roads, rivers, and ports and harbors, as well as apprise themselves of measures and initiatives concerning the strategic maintenance and renewal of infrastructure.

Figure 3-2-18 Portal site for Infrastructure Maintenance Information



Source) MLIT

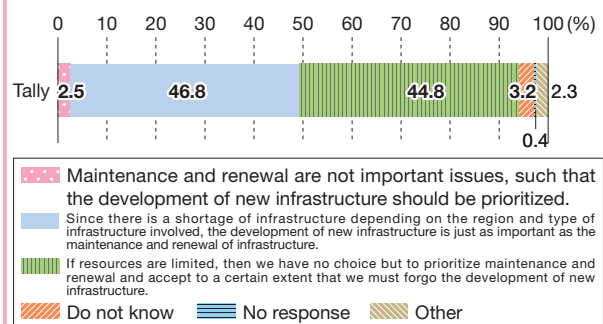
(iv) Studies concerning the adoption of Comprehensive Work Consignment to Private-sector to access the technology and expertise that can be offered by private-sector companies

In order to carry out efficient maintenance by harnessing the technology, expertise, and economies of scale that private-sector companies can offer, specific studies are being conducted in collaboration with local governments on the means by which functions for maintaining multiple areas or facilities across multiple years can be comprehensively outsourced to the private sector while utilizing local construction firms.

Through such initiatives, we will promote the use of multi-year contracting and Comprehensive Work Consignment Private-Sector outsourcing with respect to maintenance and renewal.

Questions on awareness with respect to the balance between the development of new infrastructure and the maintenance and renewal of infrastructure were asked in a monitoring survey administered to members of the general public in February 2016 by the MLIT. Approximately forty-five percent of respondents indicated that we should prioritize maintenance and renewal work, such that the way in which the public perceives these issues also suggests that prospects for the maintenance industry are quite bright (Figure 3-2-19).

Figure 3-2-19 Awareness with respect to the balance between the development of new infrastructures and the maintenance and renewal of infrastructure



Source) "Monitoring Survey" (MLIT)

Note 72 The MLIT has set up Infrastructure Maintenance Information, an information portal site (<http://www.mlit.go.jp/sogoseisaku/maintenance/>), in order to enable various types of information concerning the maintenance of infrastructure by the national government and local governments and other entities to be easily accessed and verified.

2 Improving on-site productivity

(1) i-Construction

As we saw in 1 above, the construction industry labor force continues to shrink. In light of the fact that the on-site labor force is getting smaller, we are faced with the knowledge that we cannot avoid having to improve construction site productivity to offset this trend.

At the same time, the construction industry is expected to play an important role in supporting safety and growth, such as in terms of disaster prevention and mitigation measures in response to intensifying disasters, the strategic maintenance and renewal of aging infrastructure, and the development of infrastructure and improvements in productivity for which stock effects for realizing a strong economy have been emphasized.

As performance in the construction industry undergoes a recovery and a stable management environment is secured, favorable opportunities for fully engaging in efforts to improve productivity can be said to have arrived. The time has come for us to engage in i-Construction through links among industrial, academic, and governmental circles in order to enable Japanese construction sites to stand on the global leading edge. The MLIT established the i-Construction Committee, which is made up of numerous key figures (and is chaired by Hiroshi Komiyama; the executive head of the Mitsubishi Research Institute), for the purpose of achieving the goals of i-Construction and drafted a report in April 2016.

For initiatives concerning i-Construction, the MLIT has decided to pursue the comprehensive utilization of ICT (ICT-based Earthwork), the adoption of overall optimization (involving such measures as the standardization of specifications governing Concrete work), and the standardization of construction periods as top-priority measures. Through these initiatives, we seek to enhance the productivity of all construction site processes, ranging from surveys and measurements to design work, construction, checks, maintenance, and renewal functions.

(Full-fledged utilization of ICT)

The MLIT has heretofore been engaged in various verification and testing projects across two pillars of focus: computer-aided construction [Note 73](#) and CIM [Note 74](#). Upon having ascertained, with a more global and comprehensive approach, construction processes that include the foregoing for the i-Construction initiative that consists of the comprehensive use of ICT on construction sites, we are promoting a broader use of technology—including drones (unmanned aerial vehicle), three-dimensional survey data, and unmanned automated construction technology—than before [Note 75](#).

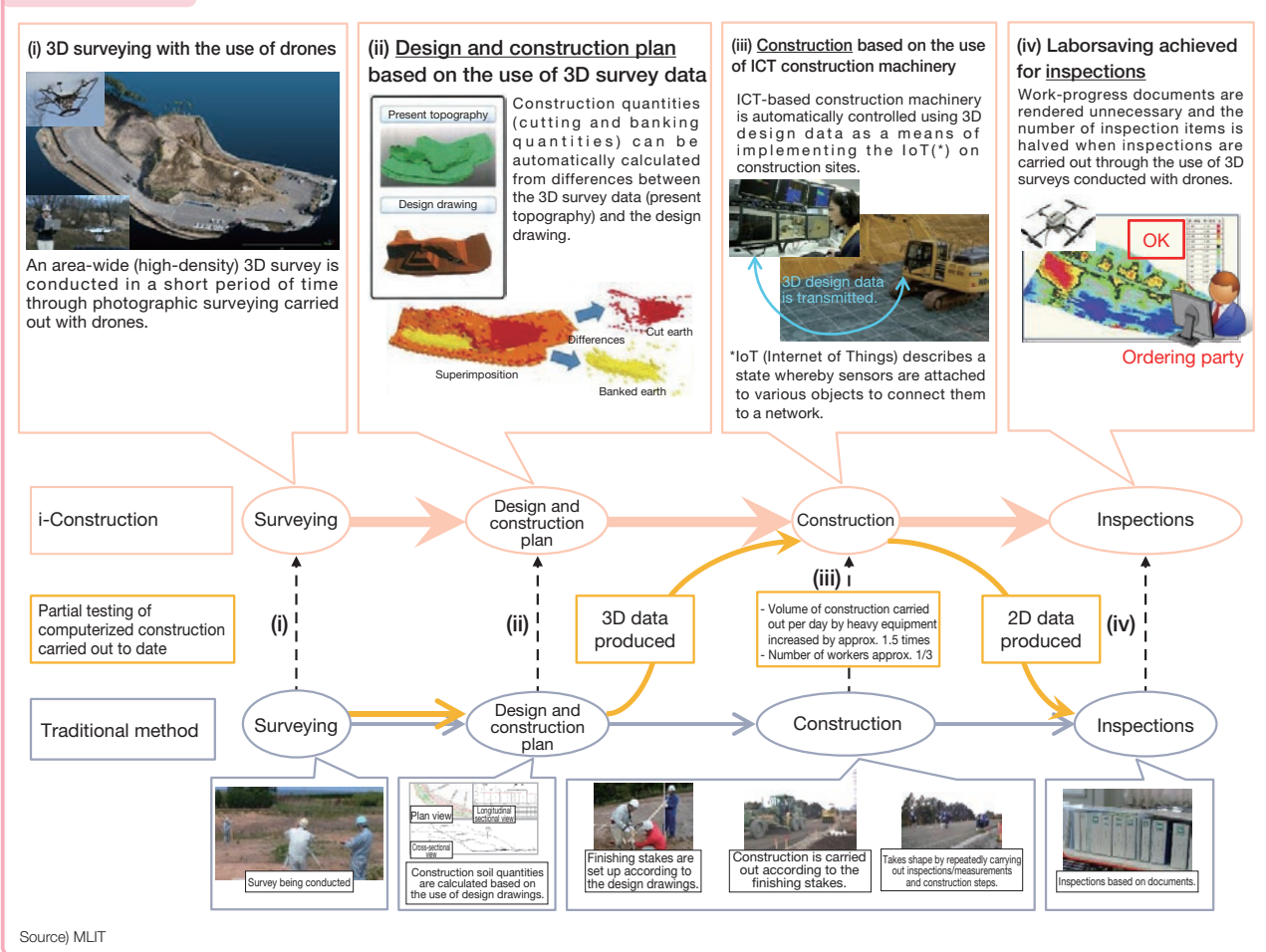
As outlined in Figure 3-2-20, we expect that the comprehensive use of ICT on construction sites will facilitate or lead to the following: (i) three-dimensional surveys conducted with drones, (ii) design and construction plans based on three-dimensional survey data, (iii) construction with ICT-based construction machinery, and (iv) significant labor savings through the use of three-dimensional inspection data.

Note 73 A system that aims to enhance productivity and ensure quality across all construction production processes by focusing on construction out of all construction production processes (surveys, design, construction, supervision and inspections, and maintenance) carried out by construction businesses and accordingly realizing highly efficient, highly precise construction based on the use of electronic data that can be derived from processes through the utilization of ICT and harnessing electronic data derivable from construction for other processes.

Note 74 A system that aims to streamline and upgrade a battery of construction production systems by adopting three-dimensional models from the planning, surveying, and design stage, expanding subsequent construction and maintenance stages by linking them to three-dimensional models, and sharing relevant information pertaining to the overall project in any given case with concerned parties.

Note 75 We aim to improve productivity through the use of integrated three-dimensional data by incorporating the spread of drones and ever-improving three-dimensional measuring techniques and data-processing technologies and applying computerized construction, for which the application of the use of three-dimensional data to MC/MG construction equipment (such as machine-controlled and machine-guided bulldozers) and TS-based work-progress control (in addition to current methods of work-progress control applied to civil engineering projects concerning roads and rivers (surveys, leveling, transiting, and more), includes work progress control techniques based on the use of total stations (which are currently used most on all sorts of survey sites as a type of survey equipment; combining electro-optical distance meters with angle-measuring theodolite, Total Stations can measure both distances and angles—tasks that had to be undertaken separately in the past—at the same time)) had been discontinued, to all processes consisting of surveys and measurements, design work, construction, checks, maintenance, and renewal functions.

Figure 3-2-20 Illustration of the use of ICT at an i-Construction-based construction site

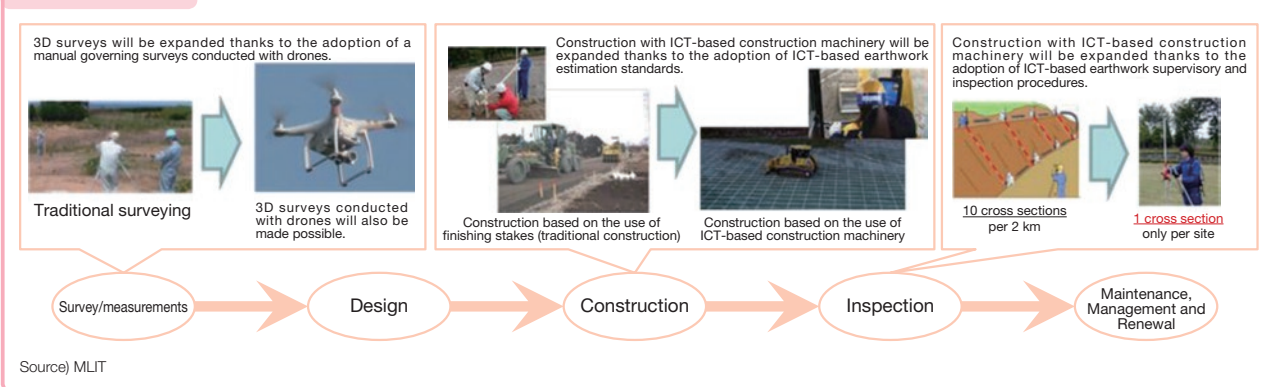


Source) MLIT

■ Adopting fifteen new standards

In order to comprehensively adopt ICT for all construction site processes, ranging from surveys and measurements to design work, construction, checks, maintenance, and renewal functions, new standards will need to be introduced to enable the integration and use of three-dimensional data. To this end, the MLIT developed fifteen new standards and adopted them in April 2016 for projects under its direct control (Figure 3-2-21). By comprehensively adopting ICT-based construction machinery and robot technologies for compliance with these standards, significant improvements in productivity are expected.

Figure 3-2-21 Examples of key new standards to be adopted from FY 2016



Source) MLIT

Column

Reform in construction work sites in Japan

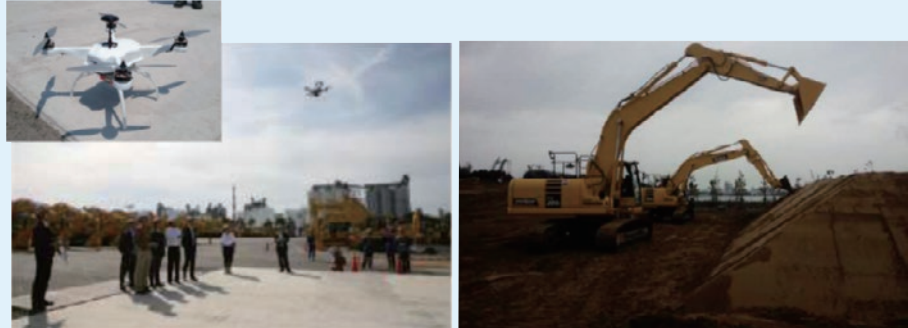
i-Construction Committee visited the Komatsu IoT Center and inspected demonstrations of surveying by drones and construction by ICT construction equipment. (Figure 3-2-22). Since 2015, Komatsu Ltd. has

provided services where it surveys the construction sites through pictures taken by drones, creates 3D models, calculates the soil volume, and utilizes the results in construction management. The company is trying to reform domestic construction worksites that suffer from a chronic shortage of workers by providing surveys by drones and other services. By combining its ICT construction equipment, the company is promoting more efficient construction work.

The service using drones can survey several million points while flying a drone for ten and several minutes, and complete detailed 3D data of the construction site in a single day. Currently, the ICT equipment has been introduced into 1,000 sites in Japan.

Figure 3-2-22 i-Construction-related on-the-spot investigation (Komatsu IoT Center)
Survey conducted with a drone

Construction using ICT-based construction machinery



Source) MLIT

(Adopting overall optimization (such as by standardizing specifications governing concrete work))

Cast-in-place concrete is noted for making planned construction work difficult depending on weather conditions. For projects involving bridges and other such structures for which high-elevation work is required, technicians working on these projects also need to have a certain level of skills given that work is being performed in a working environment that carries risks and given that work can be complex due to differences in how retaining molds are placed and reinforcing steel bars are assembled from one worksite to the next. On the other hand, even in cases in which pre-cast products are used ^{Note 76}, opportunities for using same-sized products in large quantities are limited, such that it is difficult to effectively obtain economies of scale. The environment is also one that does not easily facilitate cost reductions since there is no choice but to carry out processes from the receipt of orders to production.

In this connection, we will carry out studies with a view to adopting overall optimization ^{Note 77} and popularizing underlying technologies and introducing supply-chain management according to the attributes of cast-in-place concrete and pre-cast concrete ^{Note 78} (Figure 3-2-23) in order to improve the overall productivity of concrete work. With respect to cast-in-place concrete, we will also carry out studies on popularizing technologies with a view to improving methods of coupling and fixing reinforcing steel bars as they relate to the streamlining of such on-site work as that which involves the assembly of reinforcing steel bars and the pouring of concrete.

Note 76 Where concrete structures are built, it is typical to have concrete poured into retaining molds set up on-site. However, the use of pre-cast products is a method by which concrete components are produced ahead of time in a factory and then shipped to and assembled at the construction site.

Note 77 According to the i-Construction Committee report, “By incorporating the concept of overall optimization into concrete work, we can endeavor to streamline supply chains and improve productivity with the aim of optimizing all processes, including the designing of structures, the placement of orders, the procurement of materials, construction work, assembly work, and other elements in the sequence of production processes, as well as maintenance functions.”

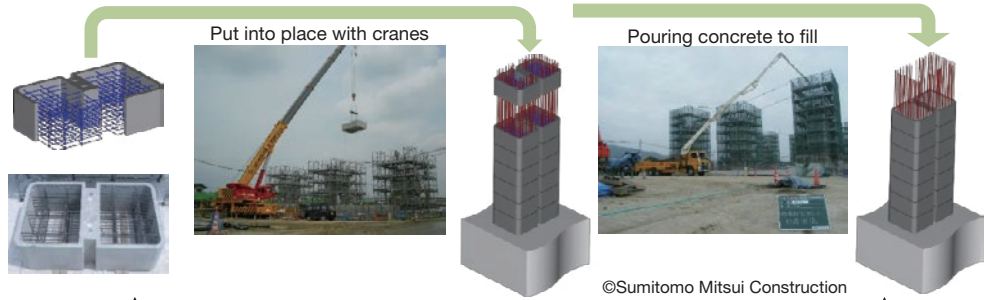
Note 78 Specifically, by standardizing component specifications (such as in terms of size), we can expect to see cost reductions and productivity improvements achieved as in-plant production is promoted and equipment and materials are diverted. Thus, pre-cast products shall be studied with a focus on expanding the scope of their application to large structures.

Figure 3-2-23 Example of an initiative to enhance the productivity of concrete works

○ Laborsaving and a shortening of the construction period (construction) are achieved through an efficient method of construction

(Example) Work to place retaining molds can be eliminated by prefabricating reinforcement steel and pre-casting molds.

Streamlining of the pouring of concrete



High-elevation work involving reinforcement steel and retaining molds is eliminated.

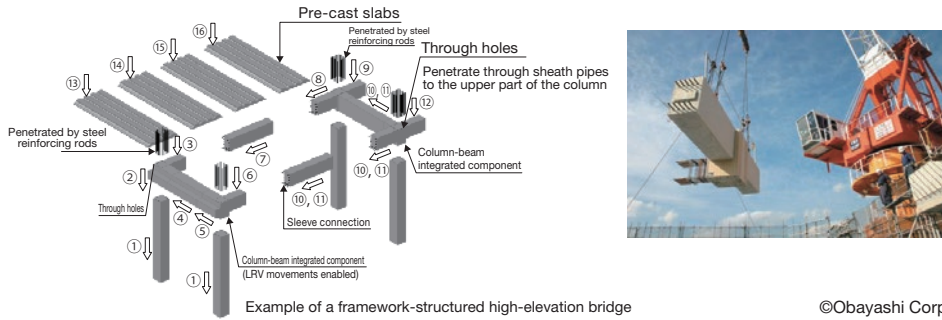
Removal of molds not required

Traditional method



Evolution of pre-cast concrete

(Example) Specifications for each component (sizes) are standardized; construction proceeds by putting together fixed-form components.



Source) MLIT

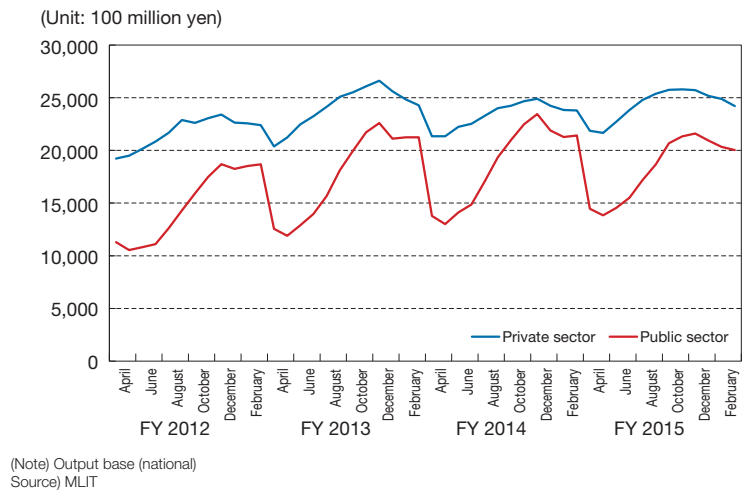
(Leveling construction timings and maintaining fair construction periods)

Since public works projects are essentially carried out according to yearly budgets, the volume of such projects being carried out between April and June is low while the busy season for such projects extends from autumn to the end of the fiscal year [end of March], such that the volume of such projects at this time of year tends to be high. If we look at the volume of projects in terms of output on a monthly basis, the project volume during the busy season was nearly 1.8 times as great as the project volume during the slack season in FY 2014 (Figure 3-2-24).

In order to efficiently use limited amounts of human resources, construction periods should ideally be standardized to stabilize project volumes throughout the year.

Since this measure can be accommodated by changing the way in which the work of ordering parties is carried out and does not require new investments, it is a measure that should be proactively

Figure 3-2-24 Changes in the volume of construction work in terms of output by month (Estimate of Construction Investment)



undertaken by ordering parties. Standardization can also be expected to restore the health of the management of Japanese construction companies, improve job conditions for workers, and help promote ownership of equipment and machinery by Japanese construction companies thanks to higher operating rates.

Standardization entails the systematic placement of orders after the standardization of construction periods and the end of construction periods is taken into account through the appropriate use of early order placement and the assumption of debts where required after the period required for each construction project is secured. It also helps to eliminate the busy season at the end of each fiscal year by discouraging the practice of forcefully finishing jobs before the end of the fiscal year and by appropriately utilizing the system of carrying forward debts where necessary (Figure 3-2-25).

It is also important to note that initiatives for standardization should be engaged in collectively by not just the national government but by all ordering parties, including local governments that account for approximately seventy percent of all public works. For this purpose, the national government, local governments, and other ordering parties shall collaborate in promoting standardization through local councils of purchasers (whose members include the national government, prefectural governments, and all municipalities and which are set up in each prefecture). It has been decided that the national government shall, where required, submit requests to local governments to promote standardization in accordance with the Act for Promoting Proper Tendering and Contracting for Public Works and other relevant laws.

(2) Promoting “Japan’s Robot Strategy”

The government formulated “Japan’s Robot Strategy” (finalized by the Japan Economic Revitalization Taskforce on February 10, 2015) in accordance with “the Japan Revitalization Strategy”. This strategy aims to achieve a new Industrial Revolution driven by robots for an advanced country dealing with a dwindling birthrate and an aging population. Against the backdrop of a shortage of leaders, the progression of superannuation, and the frequent occurrence of disasters, an action plan (outlining goals and priority implementation areas) for the years until 2020 has been indicated. Goals indicated for the construction sector include the bold introduction of computerized construction technology, an example of robot technology, to construction sites and the promotion of improvements in productivity and laborsaving efforts based on the notion that all processes, including front-end and back-end processes, form a system. To attain these goals, the promotion of integrated measures through (i) the development of technology, (ii) the adoption of technology in the field, and (iii) the

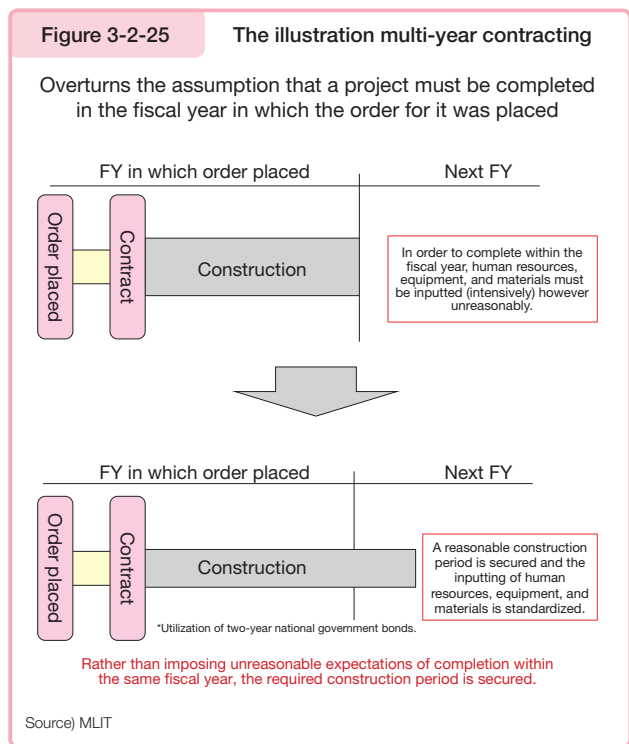



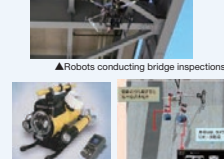




Figure 3-2-26 Examples of robots in different areas: general construction, infrastructure maintenance, and disaster responses

General construction	Infrastructure (maintenance)	Response to disasters
<p>(3) Areas that should be tackled on a priority basis Shortage of leaders, improvements in productivity, and improvements in the worksite environment</p> <p>(4) Goals for 2020 Raise the dissemination rate for computerized construction technology as a factor for increases in productivity to thirty percent (increase productivity and achieve laborsaving gains for all construction processes, including preliminary and follow-up processes)</p> <p>(Robot examples)* (Existing technologies or technologies under development)</p>  <p>▲Machine-controlled bulldozer technology</p>  <p>▲Machine-controlled backhoe technology</p>	<p>(3) Areas that should be tackled on a priority basis Shortage of engineers required for inspections, diagnostic actions, repairs, and other such actions</p> <p>(4) Goals for 2020 Utilize robots for twenty percent of important, aging infrastructure (support with robots can accommodate the soaring demand for maintenance).</p> <p>(Robot examples)*</p>  <p>▲Robots conducting bridge inspections</p>  <p>▲Underwater inspection robots</p>	<p>(3) Areas that should be tackled on a priority basis Acceleration of post-disaster surveys and the implementation of emergency measures</p> <p>(4) Goals for 2020 Enable unmanned work on par with manned work to be performed even during severe disasters (such that disaster sites that cannot be easily accessed by humans can be reached rapidly and with precision).</p> <p>(Robot examples)*</p>  <p>▲Disaster-investigation robot (flying type)</p>  <p>▲Emergency disaster-recovery robot (unmanned construction)</p>

Source) MLIT

development of a market environment is required.

Japan manufactures and uses more robots than any other country in the world; the nation boasts of shipping industrial robots worth JPY 340 billion each year and of having approximately 300,000 operating units in the country. It is said that Japanese models of hydraulic shovels found on construction sites account for at least eighty percent of the global market while ICT construction equipment embedded with three-dimensional design data-based machine-controlling technology constitutes construction technology that is—along with unmanned construction processes and computerized construction processes—the pride of Japan.

The new robot strategy sets forth three areas—general construction, infrastructure maintenance, and disaster responses—as priority areas for the advancement of robots (Figure 3-2-26).

The MLIT will, in collaboration with leading experts in various fields in which contributions will be made to bring about technological innovations, promote the realization of the aforementioned i-Construction in the area of construction production and the development and introduction of next-generation infrastructure robots for societal infrastructure in the areas of infrastructure maintenance and disaster responses.

(Development and Introduction of Robots for the Next Generation Social Infrastructure)

While the cognitive power of robots is presently still far from being complete when compared to that of humans, it is expected that the day will come when they can replace humans performing inspection work.

The MLIT is promoting the development and adoption of next-generation robots for societal infrastructure in order to effectively and efficiently conduct inspections of massive infrastructural elements and rapidly and precisely survey disaster sites that are difficult for humans to access and carry out emergency recovery work. Over a two-year period between FY 2014 and FY 2015, highly practical robots were invited to conduct field investigations and evaluations in order to verify practicality in terms of introduction on a trial basis (Figure 3-2-27). This information, including video clips of the status of validation, has been released through our disclosure site (Figure 3-2-28) ^{Note 79}. Since FY 2016, the introduction of robots on a trial basis based on the results of field investigations has been progressively pursued. There are plans to properly arrange usage steps and other matters through trial runs performed with actual on-site operations.

Figure 3-2-27 Examples of testing with next-generation robots for societal infrastructure (non-comprehensive)

Maintenance (structural inspections)			Disaster response	
Bridge	Tunnel	Underwater	Surveys	Emergency recovery
<p>Flying type (Luca Search)</p>	<p>Ground vehicle mounted type (Pacific Consultants)</p>	<p>Submersible type (Panasonic)</p>	<p>Flying type (Luca Search)</p>	<p>Onboard type (Fujiken)</p>
<p>Pole type (Zivil Investigation Design)</p>	<p>Ground vehicle mounted type (Shimizu Corporation)</p>	<p>Boat type (Mirai Construction)</p>	<p>Flying type (Hitachi, Ltd.)</p>	<p>Onboard type (Kowatech)</p>
<p>Suspension-type compound lens-equipped imaging device (Fujifilm)</p>	<p>Flying type (NEC)</p>	<p>Idea Consultants</p>	<p>Crawler type (Hitachi, Ltd.)</p>	<p>3D surveys and remote controlled operations (Topcon)</p>

Source) MLIT

Figure 3-2-28 Portal site for publicly disclosed field tests conducted by next-generation robots for societal infrastructure

次世代社会インフラ用ロボット技術・ロボットシステム
～現場実証ポータルサイト～

What's New

- 2016年5月17日
神奈川県「さがみロボット産業特区」の取組の一環として、下記の公募事業が開始されました。
- 2016年5月16日(月): 第7回社会企業型「ロボット実証実験事業」募集開始!
- 2016年5月13日(金): 建設現場ロボットの共同開発プロジェクトがスタート!

2016年5月16日

Source) MLIT

Note 79 <http://www.c-robotech.info/http://www.c-robotech.info/>

Column Efforts toward practical use of automatic driving (automatic cruising)

In order to realize the safest road traffic society (in the world), various measures have been taken to put automatic driving technology to practical use in Japan. If the technology is fully realized, it will bring about various social advantages, such as reduction in traffic accidents, alleviation of traffic congestion, responses to the aging society, relief of overpopulation in urban cities, and reduction in environmental loads.

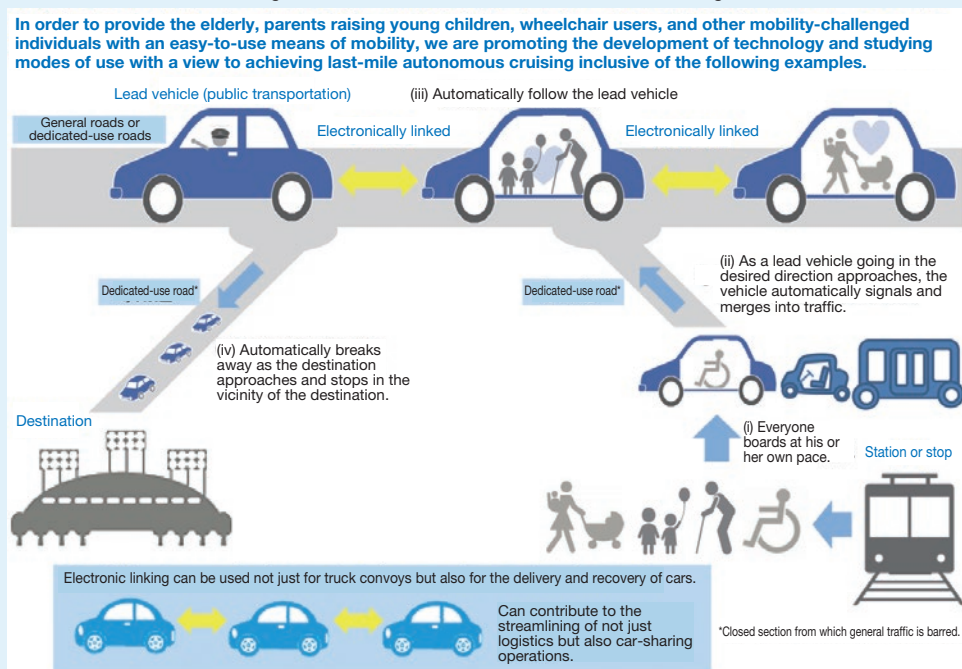
As efforts toward next-generation vehicles in Japan, the Cabinet Office and other government offices associated with automobiles established the Cross-ministerial Strategic Innovation Promotion Program (SIP), which states that the realization and dissemination of automated driving system are to be gradually promoted from the late 2010s, and the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) has also participated in the program. In addition, with the cooperation of the Ministry of Economy, Trade and Industry, the MLIT held a review meeting on the automatic cruise business in February 2015, began consideration, and put together future action policies in a report in March 2016, for the purpose of enhancing Japan's international competitiveness in the automatic driving technology and acquiring the international standards beneficial to Japan.

Automobile manufacturers in Japan, aiming to market cars that can automatically cruise on expressways from 2018 to 2020, has been conducting driving tests on public roads.

In advanced nations where society is aging, including Japan, how the elderly and persons with disabilities, who cannot drive cars, obtain means of transportation for their lives is an issue. The automated cars are expected to be one solution to this issue. Creation of an environment for safe ingress, egress, and driving will be necessary.

In the rural areas, the provision of the last one-mile of mobility suited to local needs can improve the quality of life in those areas (Figure 3-2-29).

Figure 3-2-29 Illustration of last-mile autonomous cruising



Source) Ministry of Economy, Trade and Industry

Supplemental section

**Response to The 2016
Kumamoto Earthquake**

Response to The 2016 Kumamoto Earthquake

A number of earthquakes have occurred over Kumamoto and Oita prefectures since April 14, 2016. The series of the earthquakes was named “The 2016 Kumamoto Earthquake (hereinafter referred to as “Kumamoto Earthquake”)” by the Japan Meteorological Agency (JMA). The strong ground motion at the highest seismic intensity level of 7 was observed due to the earthquakes with a magnitude of 6.5 on April 14 and with a magnitude of 7.3 on April 16, respectively ^{Note 1}. It was the first time in recorded history of JMA that larger earthquake occurred in the same area after the occurrence of an inland earthquake with a magnitude 6.5 or larger. It was also observed at “Kumamoto Earthquake” that seismic activity widely spreaded over the contiguous prefecture, Oita. “Kumamoto Earthquake” brought severe damages on lands, constructions and people’s live.

In this supplemental section, we will report additional part about the response provided by the MLIT as much as possible as of the mid-May 2016.

1 Disaster status

According to the report by JMA at 09:00 on May 16, 2016, two earthquakes with seismic intensity of 7, two earthquakes with seismic intensity of 6-upper, three earthquakes with seismic intensity of 6-lower, and 1,464 earthquakes with seismic intensity 1 or greater occurred in the series of seismic activities ^{Note 2}. Very large numbers of earthquake continue to occur, thereby impeding the recovery and reconstruction of disaster-stricken areas.

According to observations made by the Geospatial Information Authority of Japan, the estimated fault plane constitutes a dextral strike-slip fault of approximately thirty-five kilometers in length. The northwest side of the Futagawa fault zone subsided by up to two meters.

The Kumamoto Earthquake caused forty-nine deaths ^{Note 3} and resulted in over 190,000 evacuees at the height of the crisis. It also gave rise to extensive damage. For example, large numbers of homes sustained damage, sediment-related disasters occurred, the Kyushu Shinkansen derailed during operations, road blockages and other examples of damaged transportation infrastructure arose, and multiple points of damage affecting electrical and natural gas lifelines emerged.

Furthermore, the plants of automotive-related companies were temporarily shut down, thereby crippling supply chains and negatively affecting corporate activities in a number of different ways.

Note 1 Since 1996, when seismic intensity began to be measured with a seismic intensity meter, this is the first time that seismic intensity 7 have been measured twice in the same region.

Note 2 A detailed survey on the Kumamoto Earthquake conducted later by JMA showed that two earthquakes with seismic intensity of 7, two earthquakes with seismic intensity of 6-upper, three earthquakes with seismic intensity of 6-lower, and 3,412 earthquakes with seismic intensity of 1 or greater occurred from April 14 to May 16, 2016. (http://www.jma.go.jp/jma/press/1610/11c/kumamoto_seisa1610.html)

Note 3 Excludes fatalities believed to have emerged due to a worsening of injuries sustained in a disaster occurring after the earthquake struck or to illnesses caused by having to deal with physical burdens.

Figure 1

Disaster status ^{Note 4}

Human casualties

49 deaths, 360 seriously injured persons, 1,311 slightly injured persons

Property damage

- Damaged dwellings: 2,848 completely destroyed dwellings, 5,333 partially destroyed dwellings, 33,726 partially damaged dwellings
- Damaged non-residential buildings: 247 public buildings, 517 other structures

Lifelines

- Electricity (power failures): affecting up to 476,600 dwellings (as determined by METI)
- * As of April 20, the restoration of power transmission to high-tension distribution lines was completed with the exception of locations where restoration was difficult because of the impact of landslides or damaged roads.
- General gas (maximum number of dwellings subject to disruption): approx. 105,000 (as determined by METI)
- * As of April 30, the supply of natural gas to all customers was resumed with the exception of customers for whom a resumption of supply was not possible due to the destruction of dwellings or other such factors.
- Waterworks (number of dwellings affected by the disruption of running water): 445,857 (as determined by the MHLW)
- * As of May 16, running water was restored to 99.9 percent of dwellings with the exception of areas consisting of destroyed dwellings (as determined by the MHLW).
- Communications (maximum number of interrupted lines and maximum number of disrupted transmitting base stations)
 - Landlines: 300 lines; mobile phones/PHS: 628 transmitting base stations
- * According to information that is current as of May 16, all landline telephone lines and PHS transmitting base stations were restored while two transmitting base stations for mobile phones remained out of service.
- Sewage systems: 13 treatment stations were affected by the disaster (treatment functions have been secured).
 - In Aso-shi and Mashiki-machi, 10 sites suffered fractures of sewage pipes (flow-down functions have been secured using temporary pipes).

Roads (disaster-affected sites)

- Expressways: Seven lines
 - Kyushu Expressway, Nagasaki Expressway, Oita Expressway, Higashi-Kyushu Expressway, Miyazaki Expressway, Trans-Kyushu Expressway, Minami-Kyushu Westbound Expressway, Fukuoka Urban Expressway, Matsushima Road (Kumamoto Road Public Corporation)
- * April 29: All sections of the Kyushu Expressway reopened to the general public; May 9: With the reopening of all sections of the Oita Expressway to the general public, all expressways in Kyushu came to be fully reopened to the general public.
- National highways under the direct control of MLIT: Seven sections
 - National Route 3 (two sections), National Route 57 (four sections), National Route 210 (one section)
- Auxiliary national roads: 31 sections
 - National Route 212 (five sections), National Route 218 (three sections), National Route 251 (one section), National Route 265 (two sections), National Route 266 (one section), National Route 325 (four sections), National Route 387 (five sections), National Route 442 (three sections), National Route 443 (three sections), National Route 445 (three sections), National Route 498 (one section)
- Prefectural and government ordinance-designated city roads: 160 sections
- * Also see "4. State of recovery of key infrastructure" below for more information on the state of recovery.

Rivers

- Rivers managed by the national government (damage status)
 - A total of 172 sites on six rivers (Emergency measures fully completed. At 11 sites where levees were deformed to a relatively large degree, emergency restoration work was carried out; this work was fully completed by May 9.)
- Rivers managed by the governors of prefectures or mayors of government ordinance cities (damage status)
 - 322 sites on 48 rivers (318 sites in total throughout Kumamoto, three sites in total throughout Kumamoto-shi, 1 site in Oita)

Sediment-related disasters

Number of sediment-related disasters: 125 (54 debris flows, 9 landslides, and 62 slope failures)
 Human casualties caused by sediment-related disasters: Nine deaths
 * Emergency restoration work at damage-affected sites, which includes work to prevent the spread of damage through the placement of sandbags and sediment excavation on rivers clogged with sediment, is ongoing.

Rail

- Kyushu Shinkansen
 - All lines suspended;
 - Deadhead trains derailed (no injuries) between Kumamoto Station and the Kumamoto Rolling Stock Depot.
- * Operations resumed between Shin-Minamata and Kagoshima-Chuo on April 20; operations resumed between Hakata and Kumamoto on April 23; operations resumed on all lines by April 27.
- Conventional lines
 - 36 lines belonging to 11 operators suspended
 - (The following are the key lines whose operations were temporarily suspended in Kumamoto)
 - JR Kyushu (Kagoshima Line between Arao and Yatsushiro), (Hohi Line ^{Note 5}, all sections);
 - Kumamoto-shi (Suizenji Line, all sections);
 - Kumamotodentetsu (Kikuchi Line, all sections);
 - Minami-Aso Railway (Takamori Line ^{Note 6}, all sections);
 - Hisatsu Orange Railway (Hisatsu Orange Railway Line between Yatsushiro and Higo-Koda).
- * All lines have resumed operations with the exception of JR Kyushu (Hohi Line between Higo-Ozu and Bungo-Ogi) and the Minami-Aso Railway (Takamori Line, all sections).

Ports and harbors

- Kumamoto Port (regular ferry operations resumed on April 22, regular foreign container vessel operations resumed on April 23).
- Yatsushiro Port (in operations after safety measures implemented).
- Misumi Port (in operations after safety measures implemented).
- Beppu Port (as of 05:00, May 16, measures to prevent entry at two seaside locations remain in force).

Airports

- Kumamoto Airport
 - The terminal building sustained damage from the seismic intensity 7 earthquake that struck on April 16.
 - Traffic-control functions: no impediments to continued operations.
 - Regular passenger flights: While these flights were suspended after the earthquake struck on April 16, the airport has been resuming them in a phased manner since April 19. (The terminal building partially resumed operations on April 19.)

City facilities (damage status)

- Park facilities: 152 parks sustained damage (damage information provided by the MLIT as of May 17).

Note 4 Unless otherwise indicated, stated information has been excerpted from information current as of May 16, 2016, according to information provided by the Cabinet Office's headquarters for major disaster countermeasures for "human casualties", "property damage", and "lifelines (excluding sewage lines)" and according to disaster information provided by the MLIT for all other items.

Note 5 Such as sediment inflow between Akamizu and Tateno.

Note 6 Such as cracks in the inner walls of tunnels and bridge deformations between Tateno and Choyo.

2

Response of the MLIT immediately after the earthquake struck

Immediately after the earthquake struck, the government established a headquarters for major disaster countermeasures to comprehensively coordinate disaster emergency measures undertaken by relevant organizations.

The MLIT also set up an emergency system concurrent to the occurrence of the earthquake at 21:26 on April 14, 2016. After a headquarters for major disaster countermeasures was established under the auspices of the MLIT at 22:10 on the same day, the first meeting of the headquarters for major disaster countermeasures was held at 23:00 on the same day. As of May 19, 2016, a total of twenty meetings of the headquarters for major disaster countermeasures have been held.

The MLIT has been helping to facilitate disaster recovery efforts and providing support for the rebuilding of lives since the earthquake struck, such as by checking the status of damage sustained, dispatching TEC-FORCE (Technical Emergency Control Force) personnel, reinforcing evacuation systems through a lowering of the threshold for issuing a sediment-disaster alert, providing daily commodities, and securing temporary housing. Specifically, these efforts have consisted of the following:

(1) Surveying the damage caused to facilities under the jurisdiction of the MLIT

The damage caused to roads, rivers, dams, ports and harbors, airports, sewage systems, governmental facilities, and other facilities was promptly investigated. Immediately after the disaster struck, patrol vessels and aircraft were dispatched to survey the damage along coastal areas and elsewhere and provide information to nearby vessels through the issuance of navigation warnings and other means.

(2) Support provided by TEC-FORCE (emergency disaster measures contingent) personnel for local governments affected by the disaster

The MLIT dispatched liaison personnel to local governments affected by the disaster beginning overnight on April 14 immediately after the magnitude 6.5 earthquake struck overnight on April 14, 2016. On the fifteenth, TEC-FORCE personnel attached to the Kyushu, as well as Kinki, Chugoku, and Shikoku Regional Development Bureaus, and the Geospatial Information Authority of Japan arrived in Kyushu and began taking action. Up to sixty one liaisons from Regional Development Bureaus nationwide from Hokkaido to Okinawa for a total of 1,617 person-days as well as up to 440 TEC-FORCE members for a total of 8,183 person-days (preliminary numbers as of May 16 of the same year) were dispatched to seventeen municipalities to provide support to local governments affected by the disaster.

(Conducting disaster surveys on behalf of local governments)

Specifically, disaster surveys were promptly conducted on behalf of local governments to supplement information on the disaster and on support needs ascertained by liaisons and interpretations of aerial photographs taken of the affected areas to help contribute to a shortening of the time required to designate this event as a serious disaster.

(Emergency inspections of sites at risk of suffering a sediment-related disaster)

In order to prevent secondary damage caused by aftershocks or rainfall, 1,155 sites at high risk of suffering a sediment-related disaster were inspected in nine days. The governor of Kumamoto and the mayors of thirteen concerned municipalities were apprised of the results and advised on what actions should be taken going forward.

(Support provided by advisors concerning measures to deal with sediment-related disasters)

With many cases of sediment-related disasters occurring in the wake of the earthquake, advice on sediment-related disasters was sought by local governments. In response, a team of advisors in charge of measures to deal with sediment-related disasters was established. By having engineers belonging to the MLIT with expertise on sediment-related disasters provide advice at a local level in response to requests made by local governments and relevant organizations, we helped ensure the safety of search activities.

(Securing transportation routes by eliminating road obstacles)

We carried out emergency recovery work on prefectural and municipal roads blocked by subsidence and landslides of earth and sand to reopen transportation routes going from Kumamoto-shi towards Minami-Aso and otherwise secured

transportation routes for the flow of relief goods and other such items.



(Dispatching machinery for disaster measures)

Vehicles for satellite communications, illumination vehicles, sprinkler trucks, and other machinery for disaster measures were dispatched by regional development bureaus based in Kyushu, Kanto, Hokuriku, Chubu, Kinki, Chugoku, and Shikoku to support disaster-recovery work. Illumination vehicles, vehicles for satellite communications, and vehicles attached to the headquarters for major disaster countermeasures were provided to municipalities lacking electricity and means of communications with the outside world and whose government offices had been damaged. The need for support to help sustain the activities of the headquarters for major disaster countermeasures has been painstakingly accommodated.

Up to eighty-three units at a time for a total of 2,117 unit-days have thus far been dispatched (as of May 16, 2016).

Figure 7 Dispatching disaster response machinery



Source) MLIT

(Utilizing advanced machinery for disaster measures)

For locations at risk of sustaining secondary damage and locations that are geographically difficult to reach, actions based on the use of advanced equipment for disaster measures have been deployed, such as by using multi-copter (drones), rapidly and safely surveying the damage caused to sites affected by landslides of earth and sand as well as the state of faults, and removing soil using unmanned backhoes (hydraulic shovels) owned by regional development bureaus.

Figure 8 Utilizing advanced machinery for disaster measures



Source) MLIT

(3) Utilizing helicopters, aircraft, satellites, and ships

Aerial surveys were conducted to obtain a full picture of sediment-related disasters and other damage caused by this earthquake using three disaster prevention helicopters (the Harukaze, as provided by the Kyushu Regional Development Bureau; the Airando as provided by the Chugoku/Shikoku Regional Development Bureau; and the Hokuriku, as provided by the Hokuriku Regional Development Bureau).

The state of the disaster was also ascertained by taking aerial photographs and conducting aerial laser surveys using the Kunikaze III (a survey aircraft provided by the Geospatial Information Authority of Japan) while crustal movements were ascertained with the Daichi-2, an earth-observation satellite.

Patrol vessels and aircraft (belonging to the Japan Coast Guard) were also deployed to conduct damage surveys along coastal sections while a helicopter image-transmission system was harnessed to share data in real time. Information was provided to nearby vessels through navigation warnings.

(4) Emergency medical support

From April 16 to 22, 2016, Japan Coast Guard helicopters were used to transport a total of nineteen persons, including two insured persons and eleven medical doctors, at the request of Kumamoto and others.

Figure 9

Emergency photography carried out with survey aircraft



Source) MLIT

Figure 10

Transporting the injured by helicopters belonging to the Japan Coast Guard



Source) MLIT

3

Initiatives to provide support for disaster-affected persons

(1) Transporting relief goods in collaboration with logistics companies

Without waiting for specific requests to be made by affected local governments, the national government proceeded to procure goods expected to be essential primarily for the provision of support to evacuees at evacuation sites and provide push-type support for transporting goods on an emergency basis to affected areas in collaboration with private sectors.

For the provision of material support in the wake of the Kumamoto Earthquake, push-type support was provided and relief goods, including foodstuffs for 2.63 million meals, were otherwise transported in collaboration with Kumamoto prefectural government, logistics businesses and the Self-Defense Forces. Relief goods were delivered to evacuation centers through private sites accepting relief goods situated in Tosu-shi, Saga, and Hisayama-machi, Fukuoka.

(2) Providing potable water and transporting goods using ships

From April 16 to May 2, 2016, two survey and cleanup vessels—named the Kaiki and Kaiko—delivered a total of 112,340 liters of potable water to 3,583 persons in Kumamoto Port. Ten patrol vessels (belonging to the Japan Coast

Guard) also delivered a total of 189,766 liters of potable water in Kumamoto Port, Misumi Port, and Yatsushiro Port between April 16 and May 13, 2016.

To deliver goods (potable water, provisions, medical supplies, sanitary supplies, and more), vessels belonging to various regional development bureaus also made successive port calls in Beppu Port, Oita Port, Hakata Port, and other ports throughout Kyushu. Private-sector ferry operators also delivered a total of 87,000 liters of potable water at a pier near a movable bridge in Kumamoto Port and transported goods.

(3) Support for search and rescue at airports

To provide support for search-and-rescue operations by aircraft, around-the-clock air-traffic control functions were operated ^{Note 7} to provide support for the operations of aircraft (belonging to the Self-Defense Forces, U.S. military, and private-sector cargo carriers) engaged in dispatching disaster medical assistance teams (DMATs), search-and-rescue operations, and the transportation of relief goods.

(4) Securing secondary evacuation sites and providing life support

The MLIT submitted requests to accommodations-related organizations for their cooperation in getting inns and hotels to accept disaster victims. As of May 16, 2016, it has been determined that 1,768 persons can be housed at inns and hotels in Kumamoto, Fukuoka, Saga, Nagasaki, Miyazaki, and Kagoshima.

As a project of the Ministry of Defense, the Ministry of Defense began providing accommodations, meals, and bathing services on board the Hakuo, a private-sector vessel contracted through a private-finance initiative (PFI) to serve as a resting facility in Yatsushiro Port on April 23, 2016, with the backing of the Ministry of Defense and the Self-Defense Forces. This facility was used by 2,092 persons by May 17 of the same year. The MLIT supported this initiative by helping draw and communicate with users and provide support for docking purposes. In addition to the provision of bathing services to 6,323 people on board patrol vessels (belonging to the Japan Coast Guard) in Kumamoto Port, Misumi Port, and Yatsushiro Port, bathing services were also provided in Misumi Port on board large dredging and oil-recovery vessels.

Evacuation center washrooms are visited and inspected by officials with the MLIT. Emergency measures are taken for washrooms that are found to be defective and efforts have otherwise been undertaken to improve the environment in which evacuation center washrooms operate.

(5) Emergency safety checks performed on buildings and assessing the risks posed by dwellings

In order to support affected local governments engaged in the task of performing postearthquake quick inspections on buildings and assessing the risks posed by dwellings, the MLIT has submitted requests to local governments nationwide to have experts dispatched, as well as dispatched its own staff members to perform 54,028 checks on buildings in eighteen municipalities ^{Note 8} (as of May 16, 2016) and 15,656 assessments on dwellings in five municipalities ^{Note 9} (as of May 15, 2016).

(6) Securing temporary housing

In order to enable evacuees to resume their pre-evacuation lives as soon as possible, the MLIT submitted a request to the Japan Prefabricated Construction Suppliers and Manufacturers Association to make preparations to be able to respond promptly to a request made by a prefectural government for temporary housing. Construction on 1,192 dwellings in thirteen municipalities (Nishihara Village, Kosa Town, Mashiki Town, Kashima Town, Uto City, Uki City, Mifune Town, Minami-Aso Village, Ozu Town, Yamato Town, Kumamoto City, Aso City, and Hikawa Town) has begun (as of May 16, 2016) and construction is slated to begin immediately in response to requests received from municipalities.

With respect to private rental housing, a request was submitted to a real estate industry organization on April 17, 2016, for cooperation required in connection with the provision of information on private-sector rental housing to disaster-

Note 7 Around-the-clock operations were carried out at Kumamoto Airport between April 14 and 28, 2016. At Oita Airport, around-the-clock operations were carried out between April 16 and 19, 2016; thereafter, air-traffic control functions began operating each day one hour earlier than normal until April 22.

Note 8 Performed for 6,505 person-days as of May 16, 2016.

Note 9 Performed for 2,138 person-days as of May 15, 2016.

affected persons. On May 9, 2016, another request to provide cooperation required in connection with the borrowing of private-sector rental housing as temporary emergency housing was made. The real estate industry organization that received a request for cooperation from a prefectural government as concerns the provision of vacant private-sector rental housing units has been providing information and 2,526 dwellings for which applications have been received from disaster-affected persons have been provided on a sequential basis within Kumamoto (total as of May 16, 2016).

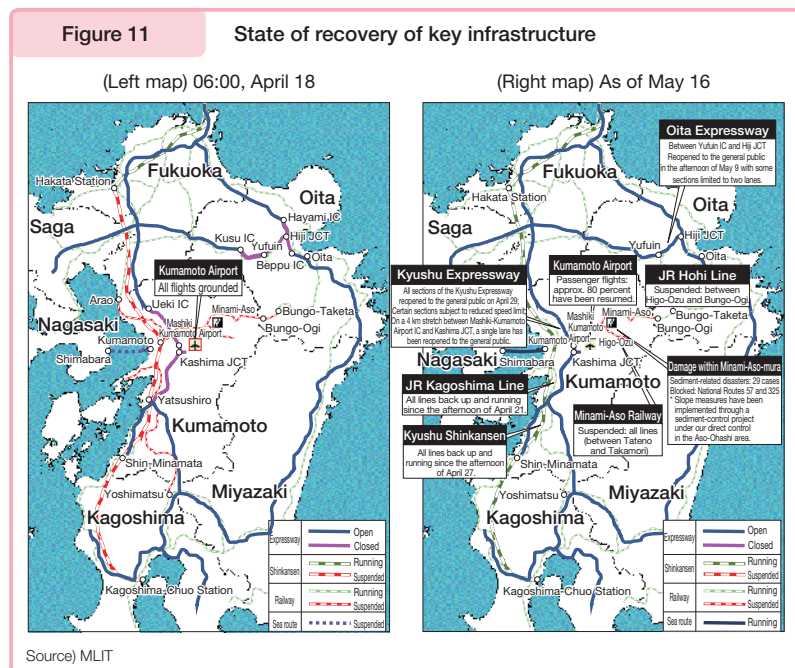
With respect to public housing, a request was submitted to all prefectural governments throughout the country on April 18, 2016, for cooperation to be extended for the provision of vacant public housing and other dwelling units as temporary housing for disaster-affected persons. Nationwide, 10,905 vacant public housing and other dwelling units have been secured (988 units in Kumamoto and 4,822 units in all of Kyushu, including Kumamoto); it has been determined that 1,025 units will be occupied (442 units in Kumamoto and 913 units in all of Kyushu, including Kumamoto) (totals as of May 16, 2016).

4 State of recovery of key infrastructure

The Kumamoto Earthquake significantly damaged key infrastructural elements ^{Note 10} and crippled the transportation network, such as by giving rise to traffic blockages on roads and the derailment of a Kyushu Shinkansen train that was in operation at the time of the earthquake.

While it is not possible to make an accurate prediction on this matter given that aftershocks continue to occur, the recovery of key pieces of infrastructure through rapid, effective responses made by concerned parties is proceeding expeditiously. For example, hard work put in by concerned persons allowed the Kyushu Shinkansen to be fully restored on all lines by April 27, thirteen days after the earthquake struck. This represented a major step towards the reconstruction of stricken areas.

In order to indicate the state of recovery, Figure 11 sets out a comparison of the state of key infrastructure on April 18, 2016, two days after a second tremor of seismic intensity 7 struck, with the state of key infrastructure as of May 16, 2016, approximately one month after the original earthquake struck.



5 Recovery of infrastructure that has sustained significant damage

The Kumamoto Earthquake caused damage to an extensive range of infrastructure, including significant slope failures in the Aso-Ohashi area, traffic stoppages on National Routes 57 and 325, and suspended operations on the JR Hoho Line. For these areas, it has been decided that new slope measures will be implemented through projects to establish national government-controlled sediment-control facilities. It was decided on May 13, 2016, that the Aso-Ohashi Bridge on

Note 10 Typically consisting of Shinkansen lines, conventional railway lines, expressways, airports, and sea routes; disaster-affected infrastructural elements are not limited to these examples.

National Route 325 will be developed on an agency basis under our direct control. In implementing measures, the stabilization of collapsed slopes and the integrated recovery of national highways and railways will be required, such that we hope to quickly restore and resume operations through the orchestration of the collective technical strengths of the national government for this purpose.

The government has designated disasters caused by the Kumamoto Earthquake as extraordinary disasters according to the Act on Large-Scale Disaster Restoration ^{Note 11} to enable the national government to take over restoration work on bridges, tunnels, and roads subject to administration by disaster-affected local governments. This will allow us to carry out restoration work on the Kumamoto-Takamori Section (a prefectural highway), which includes the Tawarayama Tunnel for which a request was received from the government of Kumamoto, and on the Tochinoki-Tateno Section (a village road), which includes the Aso Choyo Ohashi Bridge for which a request was received from Minami-Aso-mura, on an agency basis under the direct control of the national government and fully engage in rapid recovery efforts accordingly.

6

Initiatives for the revival of tourism, including in terms of the recovery of tourism resources

With respect to the tourism sector, the facilities and equipment of inns and hotels sustained direct damage, as well as indirect damage through cancellations of accommodations and other such factors. The MLIT is engaged in financing measures and the transmission of information to promote a recovery in tourism demand in collaboration with the relevant ministries and agencies in accordance with requests for support concerning the reconstruction of tourism in Kyushu as received from local areas.

Kumamoto Castle, an iconic tourism resource in Kumamoto, and its surroundings also suffered significant damage.

In light of its jurisdiction over city parks, the MLIT is slated to support recovery construction projects for park facilities ^{Note 12} in collaboration with concerned parties by holding liaison and coordination meetings with the Agency for Cultural Affairs and the governments of Kumamoto City and Kumamoto Prefecture.

With respect to measures for the reconstruction of tourism in Kyushu, the government plans to put together a general support program for the reconstruction of tourism in Kyushu in short order and is engaged in efforts to promote the reconstruction of tourism as quickly as possible by closely cooperating with local governments.

7

Supplementary budget

In order to support efforts to restore infrastructure, develop temporary housing, and rebuild the lives of disaster victims, a supplementary budget totaling 778 billion JPY was enacted on May 17, 2016.

8

Conclusion

As stated in the above text, the MLIT has been dispatching TEC-FORCE personnel from across the nation to disaster-affected municipalities since the disaster first struck and has mobilized lifesaving rescue efforts, shipped relief goods for disaster-affected residents, responded to large-scale sediment-related disasters, assessed the risks posed by buildings, supported efforts to rebuild lives, and promoted the recovery of infrastructure.

We have also promoted the flexible use of hotels, inns, and ships for evacuees, prepared a system for supplying temporary housing, and secured public housing as measures in support of disaster victims.

Safety and security underpin all economic activities and the lives of all citizens and the securing of safety and security constitutes a fundamental function of social capital. Systematic enhancements to structural measures in concert with non-structural measures that promote rapid evacuations in response to intensifying natural disasters and large-scale disasters are important in Japan, a country that possesses a national land structure and regional structure that can be described as vulnerable.

Note 11 Designated in accordance with a Cabinet order concerning the designation of an extraordinary disaster in connection with disasters caused by the 2016 Kumamoto Earthquake (Cabinet decision of May 10, 2016).

Note 12 The 2016 Kumamoto Earthquake was designated a major disaster according to the Act on Special Financial Support to Deal with Extremely Severe Disasters (Cabinet decision of April 25, 2016). Accordingly, costs incurred by local governments for disaster-recovery projects for park facilities and other public civil-engineering facilities are mitigated.

Part II

Trend in MLIT Policies

Chapter 1

Initiatives towards Restoration and Reconstruction from the Great East Japan Earthquake

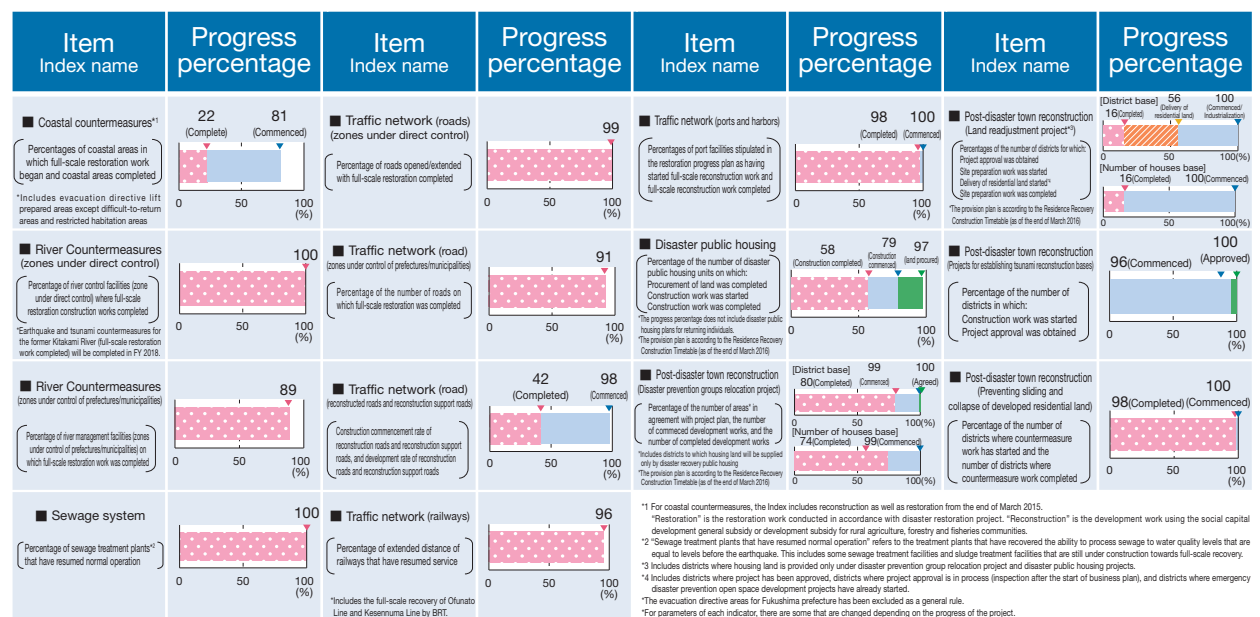
Section 1 Current Status and Measures Towards Restoration and Reconstruction

Accelerating restoration from the Great East Japan Earthquake is one of the top priorities of the MLIT. Although the number of refugees has decreased from the initial 470 thousand individuals at the time of the earthquake, around 171 thousand people ^{Note 1} currently lead lives in evacuation in approximately 1,138 municipalities ^{Note 2} throughout 47 prefectures. Five years on from the earthquake, a new phase entitled Reconstruction and Revitalization Period started from April 2016. The MLIT is working to further expedite the restoration and reconstruction processes, making an all-out effort so that people from the affected areas can actually experience the progress in restoration.

Attentive to voices from areas affected by disaster, the MLIT will work as a united body to swiftly respond to on-site needs of the Regional Development Bureau, the District Transport Bureau, the Japan Meteorological Agency, and the Japan Coast Guard. In order to achieve this goal, in January 2013, we split the parliamentary secretaries into groups of three, and assigned a prefecture to each group as an Affected Area Assistance Team within the MLIT to respond sensitively to requests from each area affected by disaster.

The emergency restorations of basic infrastructures such as roads and ports are mostly complete, and full-scale reconstruction work advances steadily as well. We will continue to faithfully execute the work according to the infrastructure progress schedule. Also, the rebuilding of homes and urban development towards restoration are steadily making progress in line with the Residence Recovery Construction Timetable, and we will continue to provide support to the affected areas with care. We will also work to secure local public transportation and promote tourism in the affected areas.

Figure II-1-1-1 Status of Progress Towards Full-scale Restoration and Reconstruction of Public Infrastructures (as of the end of March 2016)



Source) MLIT

Note 1 170,841 people as of March 10, 2016, based on study by Reconstruction Agency

Note 2 As of March 10, 2016, based on study by Reconstruction Agency

Section 2 Steady Recovery and Reconstruction of Infrastructures and Transportation

(1) Outline

For the public infrastructures under the jurisdiction of the MLIT, we are steadily working towards transitioning from the emergency restoration phase to full-scale restoration and reconstruction based on the project plan and progress schedule. We will continue our endeavors now and in the future to achieve the full recovery of northeastern Japan as soon as possible, while staying mindful of requests from disaster stricken areas.

(2) Coastal Countermeasures

In terms of the full-scale restoration and reconstruction of the coastal levees and so on, of the shores of the 677 districts where restoration and reconstruction is to be done, construction has begun in 550 districts and has been completed in 152 districts as of the end of March 2016. Of these, a section of about 36 km has been finished out of the approximately 40 km of the national construction area (including the section for which the national government will cover disaster recovery) with the completion of its entirety aimed to be around the end of March 2017. Also, reconstruction of the bay mouth breakwaters will be continued systematically so that there will be as little hindrance as possible to the city building and industry activity, which is targeted to be completed around the end of March 2019.

In proceeding with construction, whenever possible, we are incorporating structures where the effects of the levees will persistently demonstrate their capabilities, even when they are struck by tsunamis. In Iwanuma city, Miyagi, we have established a model where the coastal levees are integrated with green coastal levees comprised of coastal levees with vegetation planted throughout. We also actively use disaster waste for coastal levee material, while paying careful attention to the surrounding landscape and natural environment during reconstruction.

(3) River Countermeasures

Full-scale restoration work to secure pre-earthquake safety levels has been completed for the affected river management facilities in zones managed by the national government. Building on this, we will implement the necessary earthquake and tsunami countermeasures.

(4) Sewage System

122 wastewater treatment plants (excluding seven facilities located in evacuation order areas in Fukushima) were affected. Sendai Minami Gamo Purification Center was restored from its severe damage at the end of FY 2015. All 120 treatment plants, except for the two without wastewater, were restored to normal-level operations by the end of FY 2015. Of the treatment plants located within Fukushima's evacuation order cancellation ready area, two plants have already completed full-scale recovery. In regards to the 680 km of sewer pipes affected by the disaster, 669 km was fully recovered as of the end of March 2016. We will continue to work in accordance with the reconstruction plan and aim for the earliest possible restoration and reconstruction, combined with the incorporation of earthquake- and tsunami-resistant structures.

(5) Countermeasures against Sediment-related Disasters

Regarding countermeasures against sediment-related disasters in order to safeguard traffic networks that are indispensable in reconstructing stricken areas of water systems, such as the Abukuma River, reconstruction was completed at the end of FY 2015. We will continue to push ahead with countermeasures against sediment-related disasters in such areas where sediment-related disasters occurred at the time of the Great East Japan Earthquake.

(6) Roads

(1) In regard to expressways, the Joban Expressway, which was fully opened to traffic on March 1, 2015, is frequently used, with traffic volumes of 10,000 vehicles or higher per day in many sections. The Joban Expressway also encourages companies to move in the area along this expressway in Hamadori, Fukushima, which generates employment in this area. Additional interchanges, Okuma IC and Futaba IC, were newly planned to develop on June 12, 2015. (2) In regard to the national highways that are under direct control of MLIT, full-scale reconstructions were basically completed by the end of 2012. Furthermore, the major disaster areas were reconstructed based on the restoration plan, including the bridges on national road route 45 and other structures. (3) In regard to the reconstruction of roads/support roads, the work on the main

structures, such as bridges, has begun in earnest. The work is simultaneously being completed on all areas, including zones that have been newly privatized, and through the application of the Project Promotion Process (PPP), we are able to make use of the private sector's technological skills. Among many Reconstruction Road and Reconstruction Support Road projects that were planned after the Great East Japan Earthquake, 15 sections with a total length of 110km have moved a step forward toward their reopening.

(7) Railroads

Of the railways that were damaged by the Great East Japan Earthquake, the Sanriku Railway resumed full operations in April 2014, the Ishinomaki Line in March 2015, and the Senseki Line in May 2015. Regarding the Ofunato Line and the Kesenuma Line, where the BRT ^{Note 1} has been operated as a temporary restoration measure to secure public transportation, the meeting of local government heads in areas along the lines, which was presided over by the senior vice-minister of MILT, was held in June 2015 for the purpose of having high-level discussions on restoration policy. In the second meeting in July 2015, the East Japan Railway Company proposed full-scale restoration by BRT. In the third meeting in December 2015, the acceptance of full-scale restoration by BRT was agreed for the Ofunato Line, as well as Minami Sanriku-cho and Tome-shi of the Kesenuma Line, with continued discussions for Kesenuma-shi. Subsequently, Kesenuma-shi expressed its acceptance in March 2016, and full-scale restoration by BRT was decided for the Kesenuma Line as well. As a result, the only railway lines with zones where service is still suspended are two of Japan Railways East Japan lines (JR Yamada Line and Joban Line).

As for the Yamada Line, JR East and relevant parties, including local government bodies, agreed to transfer the management of the line from JR East to Sanriku Railway in February 2015. The restoration work, which started on March 2015, is now underway, targeting completion by the end of FY 2018.

In regards to the Joban Line, the policy to resume operations for the entire line in the future was decided in March 2015. In March 2016, the previously undecided target date for the opening of the route between the Namie and Tomioka stations was scheduled at the end of FY 2019. This provides the clear prospect of resuming operations for the entire Joban Line ^{Note 2}.

(8) Ports/Harbors

For the ports and harbors, the disaster restoration of the port/harbor facilities vital to industry and logistics was mostly completed in FY 2014. The restoration of the bay mouth breakwater will be continued according to plan, while the port/harbor facilities that are foundational to the economic recovery, such as quay walls and breakwater, have been repaired. The Japan Coast Guard plans to complete the restoration of incomplete 16 (as of March 2016) of the 158 aids to navigation that were damaged by the Great East Japan Earthquake in concert with the restoration of ports and harbors and breakwaters.

Meanwhile, the sea area landfill sites of the Sendai Shiogama and Ishinomaki ports zone and the Ibaraki and Hitachi-Naka ports zone are undergoing maintenance in order to advance the disposal of disaster waste produced by the Great East Japan Earthquake. Landfill disposal has started in the Sendai Shiogama and Ishinomaki ports zone in February 2013 and in the Ibaraki and Hitachi-Naka ports zone in July 2012.

Note 1 Abbreviation for Bus Rapid Transit, meaning a bus transportation system that is faster and more punctual than regular route buses by operating trains on bus-only roads.

Note 2 Scheduled opening of the Joban Line

Route between Hamayoshida and Soma Stations: Operations to be resumed by the end of December 2016 (announcement by JR East on November 26, 2015)

Route between Haranomachi and Odaka Stations: Operations to resume by spring of 2016 ("Outlook for resumption of operation of the entire Joban Line" dated on March 10, 2015)

Route between Odaka and Namie Stations: Targeting opening within two years (spring 2017) (ditto)

Route between Tomioka and Tatsuta Stations: Targeting opening within 2017 (report by JR East at the Hamadori's restoration promotion council for the Joban Line restoration council on February 23, 2016).

Route between Namie and Tomioka Stations: Targeting opening by the end of FY 2019 ("About outlook for opening of the entire Joban Line" dated March 10, 2016)

Section 3 Promoting Post-Disaster Town Reconstruction and Securing Stability of Residency

To give the disaster victims a prospect as to when they will be able to secure a residence, we are working on the promotion of post-disaster town reconstruction and securing the stability of residency, taking into account the “Residence Recovery Construction Timetable” that organizes the prospects for the provision of building lots for private residences and the completion of disaster public housing based on reports from local governments. As the reconstruction projects progress full-scale in the disaster affected areas, we need to compensate for the lack of personnel and know-how in the disaster affected municipalities to help the projects progress smoothly.

For these reasons, in addition to supporting the progress of projects by providing personnel support to disaster affected local governments, implementing procurement methods for relieving the burden of procurement operations in disaster affected local governments, and utilizing the Urban Renaissance Agency, we also disseminate information by providing technical support through notifications regarding procedures for the efficient execution of reconstruction projects and by posting the “*Reconstructive City Development Index*”, an online website for compiling support initiatives.

(1) Promoting Post-disaster Town Reconstruction

For post-disaster town reconstruction, various projects are being carried out, such as the “disaster prevention group relocation project”, which helps people whose homes are in the zones considered unsuitable for residences, and the disaster urban area land recovery and readjustment project, which supports comprehensive town building by combining work on the public facilities, such as building sites and roads with the site reconstruction work on tsunami disaster affected urban areas, as well as the preparation of building sites for relocation to higher grounds.

As of the end of March 2016, the disaster-prevention group relocation project secured the consent of the Minister, which is a statutory procedure required for starting the project, for all 331 districts in which implementation of the project was planned under the “Residence Recovery Construction Timetable”; 328 districts started site preparation works and 266 districts completed the work. As for the land readjustment project, project approval was obtained and construction work started in all 50 districts under the Residence Recovery Construction Timetable, and eight of those districts completed the construction work.

(2) Securing Stability of Residency

For victims who are able to build or obtain housing by their own means, interest rates are lowered for disaster recovery housing loans provided by the Japan Housing Finance Agency. Disaster recovery housing loans are also provided to victims who only suffered damages to their real estate. Pre-existing loans were given up to five-year extensions on payments and payment deadlines, as well as interest rates being lowered for loans amid payment.

Victims who face difficulties in building or obtaining housing by their own means are being provided public housing (disaster public housing) by local governments. In addition to distributing grants to offset the cost of maintenance in these facilities and expenses resulting from lowering rent for victims, we are devising special arrangements concerning the requirements for occupant qualification and assignment of housing facilities.

Moreover, in response to the Fukushima No. 1 nuclear power plant accident, we plan to secure the stability of residency for refugees residing in evacuation order areas (evacuees or returnees) by providing them the same accommodations as the disaster victims, such as moving into disaster public housing.

Figure II-1-3-1 Development Status of Disaster Public Housing (March 31, 2016)

Prefecture	Procuring of land	Design started	Construction commenced	Construction completed	Overall plan
Iwate prefecture	5,636 houses 188 districts	5,085 houses 169 districts	4,631 houses 138 districts	3,168 houses 102 districts	5,771 houses
Miyagi prefecture	15,290 houses 399 districts	14,746 houses 379 districts	13,394 houses 342 districts	9,812 houses 262 districts	15,919 houses
Fukushima prefecture	7,716 houses 156 districts	7,105 houses 148 districts	5,163 houses 123 districts	3,767 houses 97 districts	7,885 houses ^(Note)

(Note) 1 The plan number is from the Residence Recovery Construction Timetable (as of the end of March 2016).

2 Regarding Fukushima's disaster public housing, the overall plan is not finalized for disaster public housing for returnees from evacuation due to the nuclear disaster.
Source) MLIT

Section 4 Securing Local Public Transportation and Promoting Tourism

(1) Securing Local Public Transportation

In regards to local public transportation, which suffered damage from the Great East Japan Earthquake, we are implementing exceptional measures, such as mitigating the auxiliary requirements for the Regional Public Transportation Securement, Sustentation, and Improvement Projects to support the securing and maintaining of local public transportation systems, such as buses, and to share taxis in disaster affected areas. Specifically, these measures support the securing and maintaining of inter-regional mainline bus transportation networks, as well as community bus transportation for daily commutes between evacuation shelters, temporary housing, remaining settlements, and newly built housing, hospitals, shops, and public agencies.

(2) Reviving Tourism

To recover the major drop in the number of foreign tourists coming to the Tohoku area after the earthquake, we are working on dispelling harmful rumors in major overseas markets and engaging in PR work regarding the recovering of tourism in this area.

To be more specific, we posted accurate information regarding radiation doses on the Japan National Tourist Organization website for the benefit of overseas consumers, and we invited members of foreign media to the Tohoku region and implemented the transmission of information about Tohoku through SNS to promote the appeal of Tohoku as a tourist destination. In addition, we invited overseas travel companies to the Tohoku region and communicated tourism information about the Tohoku region by supporting the development of travel products and having an overseas travel exposition.

We are also implementing different initiatives to recover national tourism. For the Pacific Ocean coastal areas in particular, we supported efforts by both people in departing and arriving areas by developing public relations for the recovery and dispelling of harmful rumors, preventing the memories of the earthquake from being forgotten, promoting regional systems for the recovery of tourism, and advancing the creation of travel products and recovery tours that are unique to the region. In addition, to facilitate the earliest possible recovery of tourism in Fukushima prefecture, we supported tourism-related businesses that contributed to the efforts for reputation damage control and disaster recovery.

According to the Accommodation Survey by the Japan Tourism Agency, among the six Tohoku prefectures ^{Note 1}, the total number of guest nights was approximately 32.51 million in 2015 ^{Note 2}, which is a 7.5% increase compared to 2010 before the earthquake. However, if we look at the total number of guest night at tourist oriented accommodations ^{Note 3}, the number decreased by 13.3% compared to 2010, showing that the major scars left by the earthquake disaster are preventing the national economic boom from reaching these areas ^{Note 4}.

Note 1 The six prefectures in Tohoku Region: Aomori, Iwate, Miyagi, Akita, Yamagata, and Fukushima.

Note 2 Provisional values.

Note 3 Accommodations have at least 50% of overnight guest staying for tourism.

Note 4 Because surveys conducted for March 2010 figures and prior to that were conducted on facilities with at least 10 employees, the number of guest nights at facilities with at least 10 employees was also used for 2015 figures.

Section 5 Ensuring the Smooth Execution of Reconstruction Projects

The restoration/reconstruction projects for the disaster areas are moving forward steadily and the home rebuilding/town reconstruction is basically progressing according to the “Residence Recovery Construction Time Table”.

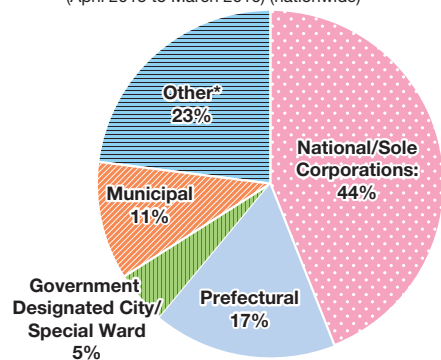
Cases of unsuccessful bidding are decreasing overall, and contracts were concluded for most of the projects for which bidding was previously unsuccessful by devising ways, such as revising predetermined prices to reflect current market prices at the time of reordering and making the size of orders more appropriate.

MLIT has been taking necessary measures to assist the smooth execution of reconstruction projects by cooperating with the institutions concerned and related industries in “Restoration Acceleration Meetings” (held 6 times since March 2013) and the “Council to Secure Execution of Reconstruction Projects” (held 8 times since December 2011). In order to set predetermined prices that reflect current market prices, the unit price of design work for public works in the three affected prefectures has been raised four times since April 2013, and reconstruction production rates, which are based on construction works conducted, and the reconstruction coefficient were introduced. Also, the national and prefectural governments established public ready-mixed concrete plants.

Furthermore, the MLIT is also working on measures to ensure smooth execution of projects for public building construction that are in the full-scale implementation stage, such as disaster public housing, schools, government offices, and hospitals. These measures include the reflection of the current market prices and the actual state of construction sites in the predetermined prices, such as by continuation of the special measure on standard construction expenses for disaster public housing and promoting the use of the construction and repair cost estimation method developed by the MLIT for the reconstruction of public buildings, as well as providing individual consultation with care at the public buildings construction inquiry desk from the ordering phase in coordination with the Reconstruction Agency and other relevant parties.

Figure II-1-5-1 Consultation at Public Buildings Construction Inquiry Desk (Nationwide Total)

Breakdown of Organizations using Consultation Service (April 2015 to March 2016) (nationwide)



*Other: design offices, construction business operators, etc.

Source) MLIT

Breakdown of Contents using Consultation Service (April 2015 to March 2016)

Content of Consultation	Total Number of Consultations(nationwide)	Total Number of Consultations (Tohoku jurisdiction)
Quantity survey, design and bidding process	1,053	38
Conservation	578	26
Construction supervision	294	2
Planning	342	62
Other	221	4
Total	2,488	132

(Note) Consultation should be directed to the public buildings construction inquiry desk in the MLIT website or eizen@mlit.go.jp

Section 6 Reconstruction, Revitalization, and Etc. of Fukushima

After the occurrence of the Tokyo Electric Power Fukushima No. 1 Nuclear Reactor accident, the number of refugees from the evacuation zones was approximately 70,000 individuals ^{Note 1}, while the total number of refugees in Fukushima prefecture, including self-imposed evacuees, climbed to approximately 97,000 individuals ^{Note 2} (according to studies by the Reconstruction Agency). Following the lifting of the evacuation directive for Tamura-shi, Kawauchi-mura, and Naraha-machi, moves toward the lifting of the evacuation directive are gathering pace in other municipalities. Based on this, in order to enable the rebuilding of lives and regional revitalization as soon as possible, the government needs to deepen support measures for the early return and new life and enhance initiatives toward rebuilding and self-sustenance

Note 1 As of September 5, 2015.

Note 2 As of March 28, 2016.

of businesses and livelihoods.

The MLIT strives to realize the soonest possible return of those in evacuation centers through efforts to reconstruct infrastructures in accordance with the progress schedule, implement measures for the toll-free use of expressways for refugees, and overcome harmful rumors in accordance with the Early Return and Resettlement Plan (established in March 2013), the Evacuation Lifted Districts Reconstruction and Revitalization Plan (amended on June 2014), and the Speeding Up of Recovering Fukushima from the Effects of the Nuclear Accident (amended in June 2015), which were based on the Act on Special Measure for the Rebirth of Fukushima.

Section 7 Building Tsunami-resistant Communities by Learning from the Great East Japan Earthquake

Based on the lessons learned from the Great East Japan Earthquake, in December 2011 the Law for Tsunami Disaster Prevention District Building was established and put into effect. This law is based on the thinking that even when a maximum level tsunami occurs, people's lives are the number one priority, and the promotes building districts that are well fortified against tsunami disasters with the concept of multiple defenses that combine structural and non-structural measures.

The MLIT provided technical advice related to the enactment of the aforementioned law to support local governments in building communities resistant to tsunamis, published guidance documents regarding the settings for tsunami flood suppositions, and opened a consultation desk for inquiries related to tsunami flood suppositions. Also, in order to configure a maximum class tsunami fault model for the Sea of Japan where the accumulation of scientific knowledge is insufficient, the MLIT is providing technical support by publishing reports of the Study Commission of a Large Scale Earthquake in the Sea of Japan.

Tsunami flood suppositions for maximum level tsunami occurrences have been published for 27 prefectures (as of the end of March 2016). Also, since March 2014, Tsunami Disaster Caution Zones were designated in Tokushima, Yamaguchi, and Shizuoka (Minami Izu-cho and Kawazu-cho), and five municipalities have developed plans for comprehensively promoting building of tsunami resistant regions (promotion plan).

In the disaster affected areas, 24 districts are proceeding with recovery efforts using the Law concerning the Construction of Tsunami-resistant Communities, like making city planning decisions regarding the Tsunami-resistant Urban District Forming Facility by Building a Housing Complex (as of the end of March 2015).

Going forward, we must take into consideration the characteristics of the entire region and using the existing public facilities to combine 'structural' measures like sea embankments with 'non-structural' measures like evacuation drills to further proactively advance the construction of tsunami-resistant communities to protect the lives of citizens.

Chapter 2

Deploying Land, Infrastructure, Transport and Tourism Administration Tailored to Urges of the Times

Section 1

Driving the Implementation of a National Land Policy Package

The MLIT has been driving forward comprehensive land policy based on the National Spatial Strategies (National Plan) (cabinet decision in 2008), Regional Plans for eight blocks nationwide (Minister decision in 2009), and the Fourth National Land Use Plan (National Plan) (cabinet decision in 2008), as comprehensive guidelines on building national land. In order to respond to drastic changes in the situations surrounding national land, including rapidly declining population, low birth rates, and a possibly imminent large-scale disaster, the MLIT published the “Grand Design of National Spatial Development Towards 2050” in July 2014 to share the sense of crisis with the public and show the principles of national land and regional development with a medium- to long-term view (generally 2050 in sight). Also taking this into consideration, in August 2015, changes to the National Spatial Strategies (National Plan) and the National Land Use Plan (National Plan) for roughly the next 10 years were adopted by a Cabinet decision.

The new National Spatial Strategies (National Plan) have the basic vision of building convection-promoting national land that creates active movements of people, goods, money, and information between regions (convection) by refining regional individualities that are varied. Also, as national and regional structures for creating convection, the idea of *compactness and networks*—consolidating various functions that include life services into certain regions in a compact manner and connect regions with networks—was laid out. The building of the convection-promoting national land and compactness and networks for that purpose should contribute to realization of the balanced development of national land that is suitable in the coming age and leveraging the unique individualities of nature, culture, and industries specific to each region. Furthermore, the National Spatial Strategies include the correction of overconcentration of people in Tokyo as Tokyo has congestion problems while net outflows of population, mainly young people, from rural regions to the Tokyo Area continue, also taking into consideration such issues as possibly imminent large-scale disasters that include a Tokyo inland earthquake.

The Fifth National Land Use Plan (National Plan) aims at land use to enhance resilience, sustainability and prosperity in our country.

In order to manage the progress of both National Plans, as well as to examine effective promotion measures, a plan promotion task force was established in February 2016 in the National Land Development Council and started discussions toward the formation of the convection-promoting national land. In March 2016, the Regional Plan of each block was revised based on the National Plans. Also, discussions are ongoing for revising the National Land Use Plan (prefectural plan).

Section 2

Measures, etc. against Aging Social Infrastructures

(1) MLIT's Action Plans for Life Extension of Infrastructure

In Japan, those infrastructures that have been built after the rapid-growth period of the nation's economy, including Tokyo Metropolitan Expressway Route 1 laid after the 1964 Tokyo Olympic Games, are forecast to become aged simultaneously in the future with the proportion of facilities that will reach 50 years of age or older in 20 years to expanding at an accelerating pace. The ratio of the number of such highway bridges, for example, is predicted to surge from about 18% in March 2013 to about 43% 10 years later and to about 67% 20 years later (Figure II-2-2-1). Simultaneously aging infrastructures should dictate strategic maintenance/management and renewal.

In October 2013, the Liaison Conference among Ministries and Agencies Concerned with the Promotion of Measures to Combat Aging Infrastructures was inaugurated. In November of the same year, it came up with the Basic Plan for Life Extension of Infrastructure to envision future approaches directed at infrastructures of all kinds to be taken by the state, local public entities and so on. The MLIT responded by working out the MLIT Action Plans for Life Extension of

Infrastructure in May 2014 ahead of all other ministers and agencies to finalize and visualize specific approaches based on the basic plan, declaring it as a maintenance guide to present a roadmap to the implementation of maintenance cycles (Figure II-2-2-2).

The plan calls for:

- (1) checking up infrastructures periodically and repairing or renewing them as appropriate and keeping the information in chart form in a database to create maintenance cycles;
 - (2) moving ahead with further cost reductions by leveraging maintenance technologies and with lifetime extension strategically based on the concept of preventive maintenance, thereby leveling the burdens of maintenance spending;
- and
- (3) Provide financial support by granting subsidies for disaster preparedness and safety, as well as personnel support for providing training in order to drive forward the initiatives of local governments that manage most of the infrastructures.

Figure II-2-2-1 Present Status of Aging Social Infrastructures

Among all infrastructures that have been built after the rapid-growth period of the nation's economy, including highway bridges, tunnels, rivers, sewage systems and ports and harbors, the proportion of those facilities that will reach 50 years of age or older in 20 years to come will expand at an accelerating pace.
 * The status of aging of facilities is not uniformly determined by when they were initially built, but it varies depending on where they are located, how they have been maintained and managed and so on. For convenience's sake, an actual age of 50 years after initial construction is used as a measure of aging.

<<Percentage of social infrastructures that have been built for 50 years or longer>>

	March 2013	March 2023	March 2033
Highway bridges [about 400,000 bridges ^{Note 1} (of about 700,000 bridges having a bridge length of 2 m or longer)]	Approx. 18%	Approx. 43%	Approx. 67%
Tunnels [about 10,000 tunnels ^{Note 2}]	Approx. 20%	Approx. 34%	Approx. 50%
River management facilities (such as water gates) [about 10,000 facilities ^{Note 3}]	Approx. 25%	Approx. 43%	Approx. 64%
Sewerage pipes [Total distance: approx. 450,000 km ^{Note 4}]	Approx. 2%	Approx. 9%	Approx. 24%
Port and harbor quays [Approx. 5,000 facilities ^{Note 5} (4.5 m deep or deeper)]	Approx. 8%	Approx. 32%	Approx. 58%

Note 1: Approximately 300,000 bridges whose year of initial construction is unknown have been excluded from percentage calculation.
 Note 2: Approximately 250 tunnels whose year of initial construction is unknown have been excluded from percentage calculation.
 Note 3: State-managed facilities only, including approximately 1,000 facilities whose year of initial construction is unknown. (Since records generally exist for facilities built within the last 50 years, facilities whose year of initial construction is unknown are sorted out as being approximately 50 years of age or older.)
 Note 4: Including approximately 15,000 km of piping whose year of initial construction is unknown. (Since records generally exist for facilities built within the last 30 years, facilities whose year of initial construction is unknown are sorted out as being approximately 30 years of age or older and their length proportionally distributed in the ratio of construction by documented number of years elapsed.)
 Note 5: Approximately 100 quays whose year of initial construction is unknown have been excluded from percentage calculation.

Source) MLIT

Figure II-2-2-2 Summary of the MLIT's Action Plan for Life Extension of Infrastructure and Approaches based on the Action Plan

- Compile an action plan based on the Basic Plan for Life Extension of Infrastructure on the basis of approaches taken in the First Year of Social Infrastructures Maintenance.
- Focus on building maintenance cycles, cutting and leveling total costs and supporting local governments on the basis of the action plan.
 (relevant mainly to directions of approaches 1, 3) (relevant mainly to directions of approaches 5, 6) (relevant mainly to directions of approaches 1, 2, 7)

Summary of the MLIT Action Plans for Life Extension of Infrastructure (decided at May 21, 2014 meeting of the Social Infrastructure Anti-Aging Conference)

1. MLIT Roles

○ Roles of the competent authority to build schemes, and systems relevant to infrastructures ○ Roles of infrastructures managers.

2. Scope of Planning

○ Target: All the facilities whose programs or the like are supervised by the MLIT.
 ○ Period: FY 2014 to FY 2020

3. Mid- and Long-Term Cost Prospects

○ Need to have more precise estimates of the mid- and long-term prospects of the costs of facility maintenance, management, renewal and so on by probing into the actual status of the facilities and by individual facility life extension programming.

4. Directions and Descriptions of Approaches

[Directions of approaches]

<div style="background-color: #e6f2ff; padding: 2px; margin-bottom: 5px;">1 Checkups/diagnostics/repairs, renewals, etc</div> <ul style="list-style-type: none"> - Building maintenance cycles for all facilities - Reviewing the necessity of facilities and measures - Carry on and enhance support as by subsidization 	<div style="background-color: #e6f2ff; padding: 2px; margin-bottom: 5px;">2 Development of standards</div> <ul style="list-style-type: none"> - Maintaining standards in order - Update standards with new technologies and knowledge 	<div style="background-color: #e6f2ff; padding: 2px; margin-bottom: 5px;">3 Development and use of information infrastructures</div> <ul style="list-style-type: none"> - Gathering information through checkups and repairs - Accumulating information and centrally consolidating information, including that available from local governments 	<div style="background-color: #e6f2ff; padding: 2px; margin-bottom: 5px;">4 Formulation of individual facility plans</div> <ul style="list-style-type: none"> - Promoting planning and enhancing contents
<div style="background-color: #e6f2ff; padding: 2px; margin-bottom: 5px;">5 Development and introduction of new technologies</div> <ul style="list-style-type: none"> - Industry-academia-government collaboration, and matching needs with seeds - Clarification of field conditions for using new technologies 	<div style="background-color: #e6f2ff; padding: 2px; margin-bottom: 5px;">6 Budget management</div> <ul style="list-style-type: none"> - Reduction and leveling of total costs - Review of benefits and obligations 	<div style="background-color: #e6f2ff; padding: 2px; margin-bottom: 5px;">7 Constructing of systems</div> <ul style="list-style-type: none"> - Enhance qualification systems, and utilize technicians versed in advanced technical capabilities - Build a plan for partnerships between managers 	<div style="background-color: #e6f2ff; padding: 2px; margin-bottom: 5px;">8 Development of legislation, etc.</div> <ul style="list-style-type: none"> - Define shares of responsibility and respond to changes in social structure

[Key approaches]

- Start using new standards and documentation
Example: Make close-up visual checks on highway bridges once every five years
- Run new databases and enhance futuristic features
Example: Extend port and harbor databases to port managers, etc.
- Concentrate and remove facilities as needed
Example: Advise on the concentration and removal of bridges, etc. to reflect changes in social structures
- Enhance qualification systems
Example: Specify required capabilities and skills, assess and accredit associated private qualifications and so on
- Build a framework of using technicians with advanced technical capabilities
Example: Establish a system of providing technical support in the road and other fields, such as dispatching governmental officers
- Build a framework of collaborations among administrators
Example: Provide technical assistance, etc. to municipalities by support organizations composed of the national and local public entities

5. Other

○ Follow up on plans to enhance and deepen efforts ○ Active provision of information through websites or other means

Source) MLIT

In addition, in order to push ahead with these initiatives, the Fourth Priority Plan for Social Infrastructure Development adopted by a Cabinet decision in September 2015 set the strategic maintenance and renewal of social overhead capital as one of the priority goals, focusing on measures against aging infrastructures, such as by setting target indicators that include the ratio of life extension programs (individual facility plans) for individual facilities (100% within FY 2020).

In December 2015, the first follow-up was conducted on the Action Plans in order to see the progress of measures against aging infrastructure based on the Action Plans. The MLIT will continue to work on the measures against aging infrastructure in a focused and systematic manner so that required infrastructures will be sustainably maintained.

(2) Development and Expansion of the Maintenance Industry

Based on the report “Recommendations on Maintaining, Managing and Renewing Social Infrastructures” compiled in December 2013, in FY 2014, the Social Infrastructures Maintenance Strategy Subcommittee under the Infrastructure Development Council and the Traffic Policy Council investigated and deliberated matters that require continued discussions for the development of specific measures, and compiled recommendations on future directions concerning:

1. Establishment of a qualification system for inspections and diagnoses
2. Framework for conducting maintenance and management smoothly and measures for supporting local governments
3. Sharing and visualizing information pertaining to maintenance, management and renewal

In regard to the establishment of a qualification system for inspections and diagnoses, a system for registering private qualifications was introduced by announcing the Regulations on Registration of Qualifications of Technicians that Contribute to Ensuring the Quality of Investigations and Designs Concerning Public Works, which set forth required knowledge and skills according to job descriptions in November 2014, and the registered qualifications on inspections, diagnoses and the like have been used since the ordering activity of FY 2015. In addition, the Regulations were revised in October 2015 so that planning, investigation, and design activities in the building and remodeling areas, to which maintenance is complementary, are included within the scope of the registration system.

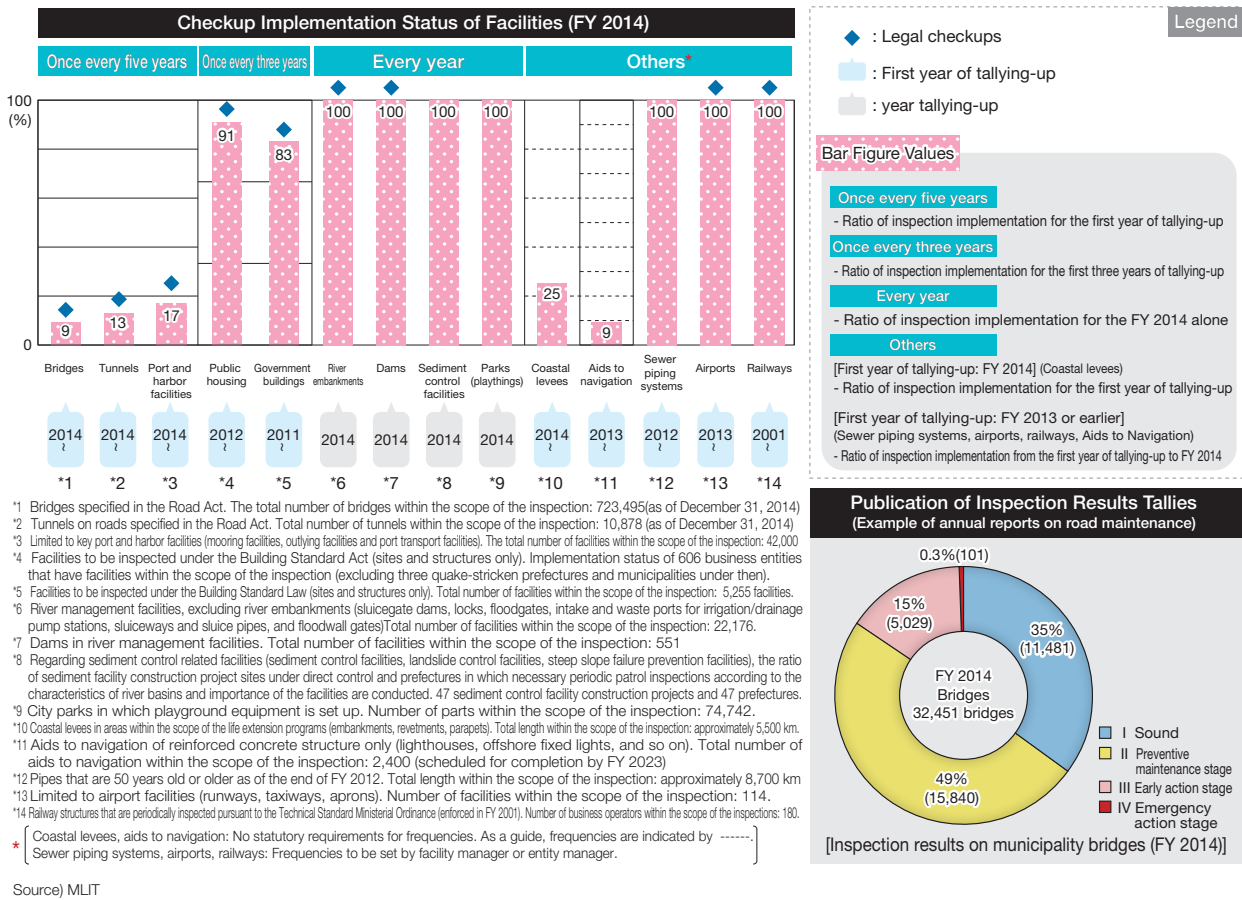
In regard to a frameworks for conducting maintenance and management smoothly and measures for supporting local governments, we are having specific discussions in cooperation with local governments on the methods of outsourcing maintenance and management works of multiple areas and facilities to the private sector comprehensively in order to leverage technologies and expertise as well as economics of scale of private sector companies for efficient maintenance and management.

In regard to sharing and visualizing of information pertaining to maintenance, management and renewal, among information on maintenance and renewal, especially important information will be made visible in the first five years in which soundness of many facilities will become clear after finishing the first round of facility inspections that based on the new standards in each field starting in FY 2013.

Also, in order to facilitate the development and revitalization of the infrastructures maintenance industry, we started examination by holding information exchange meetings toward the establishment of the Japan Infrastructure Management Council (tentative name) in FY 2016, which will serve as the platform for the unified efforts of government, industry and academia.

We will work on the development and revitalization of the maintenance industry and local industrialization through the above measures.

Figure II-2-2-3 Publication of Checkup Implementation Status in Each Field



(3) Development and introduction of monitoring technologies

Bracing for the development and introduction of monitoring technologies that provide an efficient insight into the conditions of social infrastructures, the MLIT has directed studies on the field verification of monitoring technologies to match field needs and seeds and to assess and analyze their effectiveness at the Committee for Exploring and Promoting Usage of Social Infrastructure Monitoring Technologies in October 2013. Monitoring technology hopefuls have been sought from the general public since September 2014, and their field verifications, etc. are now underway.

(4) Development and introduction of robots

The MLIT promotes the development and introduction of robots of practical usefulness that are capable of checking up growing volumes of infrastructures effectively and efficiently while probing disaster sites that are hardly accessible by human beings and expediting recovery quickly and precisely.

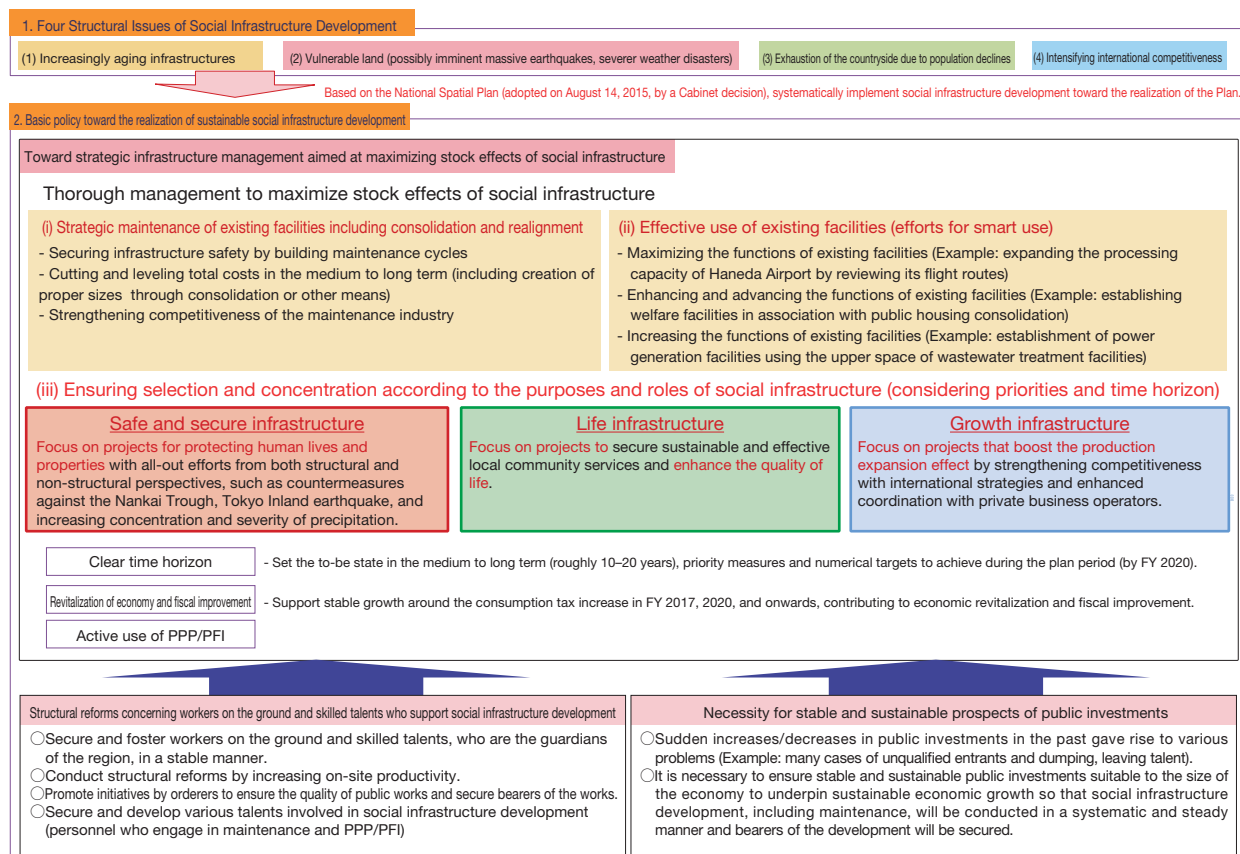
Section 3 Driving the Social Infrastructure Development

Priority Plans for Social Infrastructure Development are formulated to drive the efficient and prioritized implementation of social infrastructure development projects in accordance with the Act on Priority Plan for Social Infrastructure Development. In September 2015, the Fourth Priority Plan for Social Infrastructure Development (FY 2015–2020) was adopted by a Cabinet decision. The Fourth Plan has the basic principles of maximizing stock effects of social infrastructures in order to address the following four structural issues under severe fiscal constraint: (i) possibly imminent massive earthquakes and increasingly severe weather disasters, (ii) accelerating aging of infrastructures, (iii) battered countryside in association of declining population, and (iv) intensifying international competitions. Based on the basic principles, the Plan aims to ensure selection and concentration on projects whose stock effects are high while pushing forward the effective use (smart use) of existing facilities, as well consolidation and realignment of them. Also, the Plan for the first

time includes the positioning of the stable securing and development of on-site and skilled human resources for supporting social infrastructure development, stating that it is important to ensure stable and sustainable prospects of public investments in light of systematic implementation of social infrastructure development and securing and developing personnel who conduct it. Furthermore, in order to develop social infrastructures with medium- to long-term prospects, the Plan set four priority goals (implementing strategic maintenance and renewal of social infrastructure; mitigating disaster risk in accordance with characteristics of disasters and vulnerabilities of regions; building sustainable local communities that respond to declining/aging population; inducing private investments and enhance infrastructures that support economic growth) and 13 policy packages, and positioned typical indicators as key performance indicators (KPIs).

In order to capture the progress of plans and discuss improvements, the planning taskforce under the Panel on Infrastructure Development and Transportation Policy Council's transportation subcommittee is to appropriately conduct follow-ups going forward. As part of this activity, an expert committee was established under the planning taskforce in December 2015 and started working on the maximization and visibility of stock effects. Furthermore, the Priority Plans for Social Infrastructure Development of Regional Blocks was established in March 2016 based on the Fourth Priority Plan for Social Infrastructure Development as plans for developing social infrastructure in a focused, efficient and effective manner in accordance with characteristics of each region.

Figure II-2-3-1 The Fourth Priority Plan for Social Infrastructure Development



Source) MLIT

Section 4 Promoting the Implementation of Transport Policy

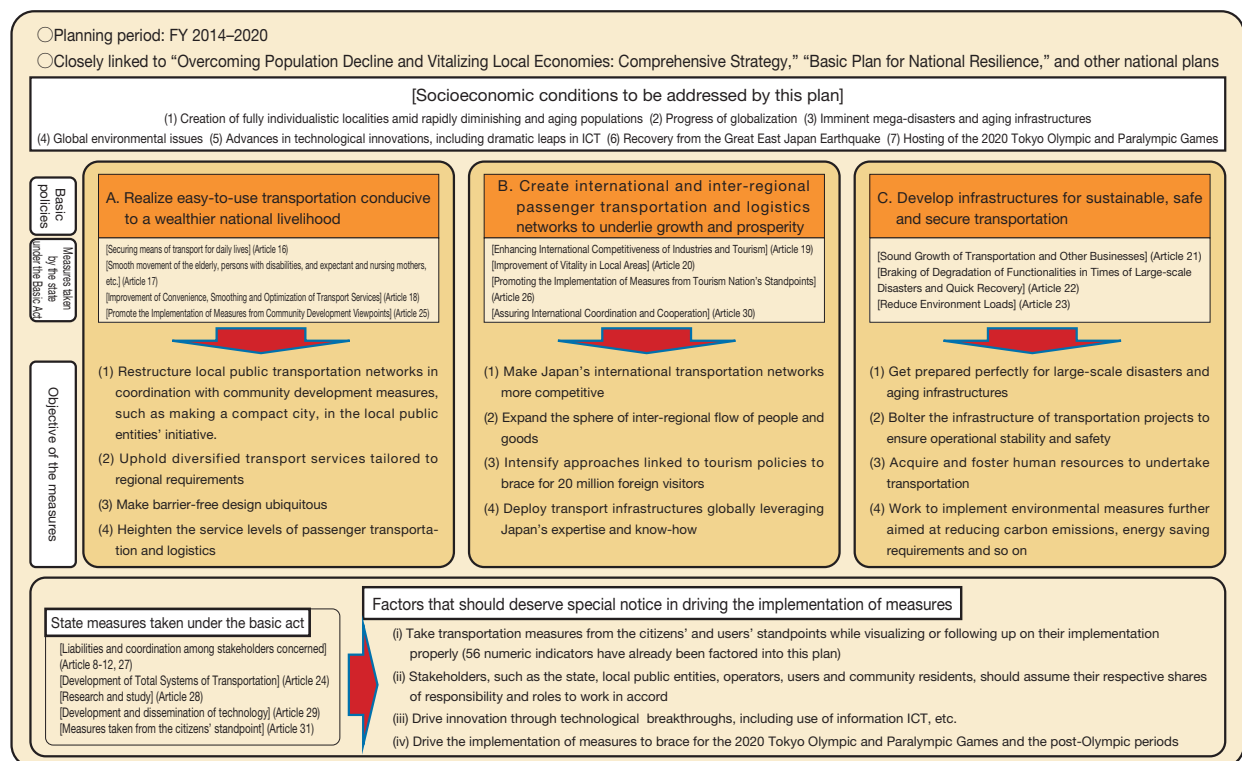
1 Developing Policies Based on the Basic Act on Transport Policy

In December 2013, the Basic Act on Transport Policy was promulgated and enacted. Based on the Act, the Basic Plan on Transport Policy was adopted by a Cabinet decision in February 2015 after deliberations at the Council of Transport Policy and the Infrastructure Development Council of the MLIT.

The Basic Plan on Transport Policy defines the period from FY 2014 to FY 2020 as a planning period and provides for basic policies, measure goals, and measures to be taken by the state on a comprehensive and planned basis. More specifically, three basic policies have been set forth as follows: (A) Realize easy-to-use transportation conducive to a wealthier national livelihood; (B) create international and inter-regional passenger transportation and logistics networks to underlie growth and prosperity; and (C) develop infrastructures for sustainable, safe and secure transportation. For each of these basic policies, four measure goals have been presented along with specific measures to approach them. Numeric indicators have also been defined to verify the progress of approaches in following up the said plan, and factors for consideration in implementing measures in accordance with the three basic policies above.

Furthermore, in June 2015, the first Transport Policy White Paper based on the Basic Act on Transport Policy was approved by a Cabinet decision and reported to the Diet. The Transport Policy White Paper is to report annually to the Diet on transport trends and measures taken, and to be taken, by the government concerning transport, and the Paper follows up on the progress of measures and numerical targets stated in the Basic Plan on Transport Policy. Going forward, leveraging the Transport Policy White Paper that is prepared annually, we will appropriately follow up on the Plan to ensure the steady progress of the Plan.

Figure II-2-4-1 Summary of the Basic Plan on Transport Policy



Source) MLIT

2 Reconstructing Local Public Transportation Networks

While population progresses to decline in an aging society with falling birthrates, concerns grow over downsized public transport networking and a degraded quality of services particularly in rural areas. In the meantime, local public transportation is of vital importance particularly to those who are unable to drive car, such as students and elderly people. Keeping up and even consolidating local vitalities calls for enhancing local public transportation in coordination with a compact community development endeavor.

Based on these circumstances, the Act on Revitalization and Rehabilitation of Local Public Transportation was amended in 2014, thereby establishing a framework for achieving the optimum transportation networks and services for each region in agreement, led by local governments in charge of regional administration with appropriate division of roles among relevant parties, taking into consideration town development and tourism revitalization. Under the amended Act, 92 local public transportation networking plans were submitted to the Minister of Land, Infrastructure, Transport and Tourism by the end of FY 2015 and a regional public transportation restructuring plan on the reorganization of bus routes having JR Gifu Station as the hub terminal in Gifu-shi received the government approval. This indicates that efforts toward the

Figure II-2-4-2

Present Status and Problems of Local Public Transportation

- Drastically declining number of passengers carried

	year 1990	year 2000	year 2010	year 2014
Passenger bus service	6.5 billion passengers	4.8 billion passengers	4.2 billion passengers	4.2 billion passengers (down 35% vs. 1990)
Local railways	510 million passengers	430 million passengers	380 million passengers	400 million passengers (down 20% vs. 1990)

Source) Annual Report on Road Transport Statistics, Annual Report on Railway Transport Statistics and Survey by MLIT

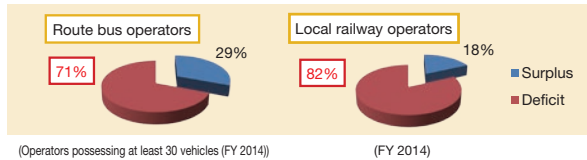
- For route buses, routes of about 8,053 km were completely abolished during the five-year period from FY 2009 to FY 2014. For railways, 37 service lines/about 754 km were abolished during the 15-year period from FY 2000 to FY 2014.

- Increasingly serious regions empty of public transportation

	Empty region	Empty area population
Bus service 500 m apart Railway service 1 km apart	36,477 km ² (approx. 30% of Japan's inhabitable area)	7,351,000 (5.8% of Japan's population)

Source) FY 2011 MLIT survey

- More than 70% of route bus operators and more than 80% of local railway operators are in deficits.



Source) MLIT

Figure II-2-4-3

Summary of the Amended Act on Revitalization and Rehabilitation of Local Public Transportation Systems (passed in May 2014)

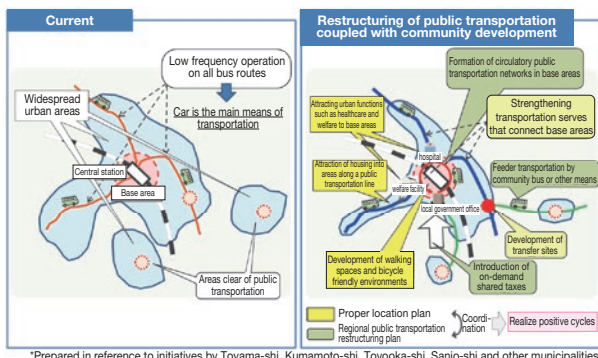
○ Act for Partial Amendment of the Act on Revitalization and Rehabilitation of Local Public Transportation Systems (promulgated in May 2014, enacted on November, 2014)

Maintaining and enhancing the vitality of local communities in society whose population is in serious decline.

Points

- (i) Local governments led (ii) Community development efforts to (iii) Restructure areal public transportation networks

The image of restructuring public transportation in unified efforts to create compact cities



*Prepared in reference to initiatives by Toyama-shi, Kumamoto-shi, Toyooka-shi, Sanjo-shi and other municipalities.

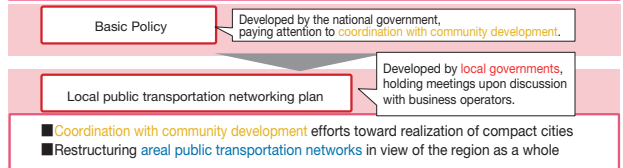
○ Act on Partial Amendment of the Act on Revitalization and Rehabilitation of Local Public Transportation Systems and the Act on Japan Railway Construction, Transport and Technology Agency (promulgated in May 2015, enacted on August 2015)

Enhance and diversify support by creating a framework for investing through Japan Railway Construction, Transport and Technology Agency, by way of industrial investments in projects for restructuring regional public transportation networks approved by MLIT Minister under the Act on Revitalization and Rehabilitation of Local Public Transportation Systems.

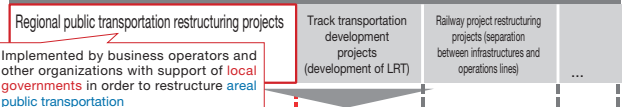


Source) MLIT

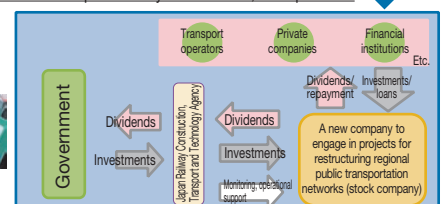
Principal scheme of the Amended Act on Revitalization and Rehabilitation of Local Public Transportation Systems



Designated local public transportation projects



Approval of MLIT Minister to support realization of the plan



formation of sustainable public transportation networks are gathering momentum.

Furthermore, in 2015, the Japan Railway Construction, Transport and Technology Agency established a program for investing in new companies that engage in businesses of rebuilding local public transportation networks, in order to diversify and enhance support. The MLIT will also continue to provide necessary support to the initiatives of local governments.

3 Promotion of Comprehensive Logistics Policy

In order to speedily and appropriately respond to socioeconomic circumstances surrounding logistics of Japan, such as the deepening of global supply chains, global warming countermeasures, and heightening needs for ensuring safety and security, the Comprehensive Logistics Policy Guidelines (2013–2017) were adopted by a Cabinet decision in June 2013. In accordance with the Guidelines, relevant ministries are pushing forward logistics policies in coordination with each other in a comprehensive and unified manner, together with other plans and policies, such as the National Land Grand Design 2050, the National Spatial Strategies (national plan), the Priority Plan for Social Infrastructure Development, and the Basic Plan on Transport Policy.

Japan has detailed and high-standard logistics services in terms of punctuality, safety, stability and reliability, conformity with shipper's orders and the like mainly through track transportation, which underpinned the just-in-time system of the manufacturing industry, and contributed to the development of the distribution industry, including convenience stores and the improved convenience of daily lives of citizens through delivery and other services. On the other hand, in recent years, the socioeconomic circumstances surrounding logistics are changing dramatically, including declining/aging population, innovations in such areas as information communication technology (ICT), heightening disaster risk, increasingly frequent deliveries of smaller goods, and diversification of customer needs. Moreover, labor shortages are especially evident and posing challenges in the logistics sector, with aging truck drivers and possibilities of increased difficulties in securing personnel in the medium to long term; therefore, actions need to be taken as early as possible.

Based on these circumstances, the logistics taskforce was newly established under the Infrastructure Development Council's subcommittee in order to deliberate on matters, such as basic directions of the future logistics policy, had a joint deliberation with the Basic Policy Taskforce of the Infrastructure Development Council's transportation subcommittee, and reported to the Minister of Land, Infrastructure, Transport and Tourism in December 2015. In order to *realize productivity innovation and evolve into attractive logistics of the future* as recommended in the report, we will promote labor saving and further improvement of efficiency, development of new markets, including overseas, and release of new services. We will also work to establish work environments for securing necessary human resources and contribute to the resolution of social problems, such as environmental measures and enhancement of disaster response capabilities.

Furthermore, from the perspective of realizing the report by reviewing systems, a bill to amend the Act on Promotion of Integration and Rationalization of the Distribution Services was submitted to the Diet on February 2016 in order to establish a framework for promoting labor saving and improved efficiency of overall logistics networks that include transportation by, for example, promoting coordination among various relevant parties that include the government, local governments, shippers, and logistics companies for achieving further efficiency and optimization of logistics systems that are important social infrastructures that support socio-economic activities.

Section 5 Driving the Implementation of Ocean Policy (Oceanic State)

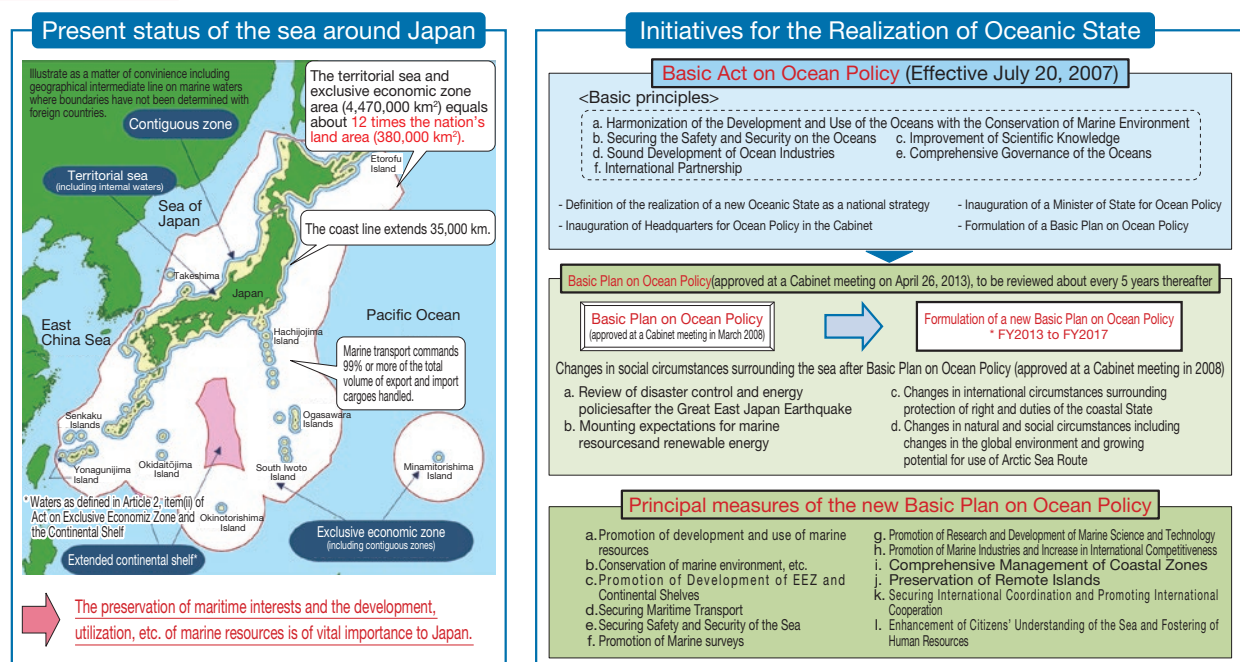
1 Driving the Basic Plan on Ocean Policy Steadily

A nation surrounded by sea on its four sides, Japan recognizes the vast expanses of surrounding sea as a frontier, which urges the nation to grow into an “oceanic state” in its true sense. The Ministry of Land, Infrastructure, Transport and Tourism has been driving the implementation of ocean policies by working in conjunction with the governmental agencies concerned pursuant to the “Basic Plan on Ocean Policy” based on the “Basic Act on Ocean Policy” as many of the administrative fields relevant to oceans fall under its jurisdiction.

Specifically, we are working on, among other efforts, the use of marine renewable energy, development and use of marine resources, fostering of human resources in ocean development, efficient marine transportation of energy resources, promotion of marine industries, and marine surveys that contribute to conservation of marine interests. Furthermore, in June 2015, the “Basic Policy concerning Preservation and Management of Islands for Management of Sea” based on the “Basic Plan on Ocean Policy” was revised by Headquarters for Ocean Policy. Taking into consideration this revised Policy, we are promoting the development of strategic maritime safety and security system, preservation of the low-tide lines ^{Note} that serves as the basis of the exclusive economic zone and establishment of environments, such as bases of activities in Minamitorishima Island and Okinotorishima Island. Also, in October 2015, the “Japan’s Arctic Policy” was decided by Headquarters for Ocean Policy. Based on this, we promote the preparation of an environment for using the Arctic Sea route.

Furthermore, on the Marine Day of 2015, we held a special event to commemorate the 20th anniversary of the national holiday and promote the understanding and interest of the public concerning the ocean. In a speech at the opening ceremony, Prime Minister Abe set the goal of having 10,000 marine development engineers by 2030 and declared to establish the world’s first master’s program in maritime safety and security policy. In addition, the IMO World Marine Day Parallel Event 2015 was jointly held with the International Maritime Organization (IMO) and other entities for the first time in Japan, where an international symposium with the theme of maritime education and training and Yokohama Declaration was put together.

Figure II-2-5-1 Driving the Implementation of Ocean Policy



Source) MLIT

Note Refers to the boundary between the land and water surface when the water surface reaches its lowest point.

2 Protecting Our Country's Interests in Maritime Rights and Interests

(1) Promoting Maritime Surveys in Territorial Waters and the Exclusive Economic Zone and Consolidating Maritime Information

In our country's territorial waters and the exclusive economic zone there are waters lacking adequate survey data and the Japan Coast Guard is conducting intensive maritime surveys in these waters including submarine topography, crustal structure, and the baselines of territorial waters to strategically and continuously implement the development of basic information that will contribute to the safety of ship traffic, protecting our country's maritime rights and interests, and maritime development.

As the result of conducting submarine topography surveys by the Japan Coast Guard's autonomous underwater vehicle (AUV) *Gondou*, in May to June 2015, records that indicate discharging of hot water/gas from the seabed was confirmed at Shirahama Sone, approximately 10 km in the northwest of Takarajima Island of the Tokara Islands, Kagoshima. It is characterized by very shallow water depth of approximately 80 m to 100 m compared to those that have been found so far in the East China Sea.

In addition, in July and November, a submarine volcanic landform, such as the trace of lava flow eruption, was confirmed at the Daisan-Miyako knoll, approximately 120 km in the north of Miyako Island, Okinawa. These findings and results are expected to be utilized as base information for the interpretation of volcanic activities going forward.

Also, under the comprehensive coordination of the Headquarters for Ocean Policy Secretariat, Cabinet Secretariat, the Maritime Information Clearinghouse, which aggregates the gathering, management, and provision of maritime information, is being operated. Additionally, the Marine Cadastre was developed which is a web service that can overlay information on maps and allows general users to utilize various natural information (submarine topography, ocean currents, water temperature) and social information (port areas, fishing rights areas, etc.).

(2) Initiatives to Delineate the Limits of the Continental Shelf

In April 20, 2012, the UN "Commission on the Limits of the Continental Shelf" adopted the recommendations on the limits of the continental shelf beyond 200 nautical miles in regard to the submission made by Japan in November 2008 in accordance with the United Nations Convention on the Law of the Sea. Since the recommendation granted an extension to Japan's continental shelf accounting for approximately 80% of her land area, the Shikoku basin sea area and the Okidaito ridge sea area were newly designated as Japan's continental shelf by a cabinet order in October 2014. In the meantime, since the review of some water areas has been postponed, the Japan Coast Guard will continue working towards the delimitation of a continental shelf by partnering with the ministries and agencies concerned under coordinated supervision of the Secretariat of the Cabinet Secretariat Headquarters for Ocean Policy.

(3) Conservation of Okinotorishima Island, Preservation of the Low-Tide Line and Developing the Base of Activities

(i) Conservation of Okinotorishima Island

Okinotorishima Island is Japan's southernmost territory and is a very important island that forms the foundation of the 400,000 km² area exclusive economic zone which exceeds the area of national land, so the observation and gathering of basic data, checkups of damages, and repairs are carried out. In addition to the two islands, the state is taking direct control to ensure adequate measures to preserve the entire atoll.

(ii) Preservation of Low-Tide Lines

In accordance with the Law on the Development of Base Facilities and Preservation of the Low-Tide Line for the Promotion of Use and Conservation of the Exclusive Economic Zone and Continental Shelf (Low-Tide Preservation Act), 185 domestic locations are designated by government decree as the low-tide lines preservation areas to implement restrictions on excavation in the area. Furthermore, surveys are conducted on low-tide lines and its surrounding conditions, using patrols by disaster prevention helicopters and ships as well as satellite images, in order to check whether any restricted activities took place or any topographical changes were caused by natural erosion. Also, information related to the low tide lines is appropriately managed so that preservation activity will be carried out in a steady and efficient manner.

Figure II-2-5-2 Preservation of the Low-Tide Area

Promoting Measures Regarding the "Law on the Development of Base Facilities and Preservation of the Low-Tide Line for the Promotion of Use and Conservation of the Exclusive Economic Zone and Continental Shelf (Low-Tide Preservation Act)" (effective in June 2010)

<<Preservation of Low-Tide Lines>>

- In the waters surrounding the low-tide line that forms the basis for demarcating the limits of the exclusive economic zone and others, areas requiring conservation are specified as the low-water line preservation areas (185 areas) where activities are restricted.
- Satellite images, disaster prevention helicopters, and ships are used to monitor and research the conditions of the low-tide line and any artificial damages or natural erosion.

<<Development and Managing the Base of Activity in Specified Remote Islands>>

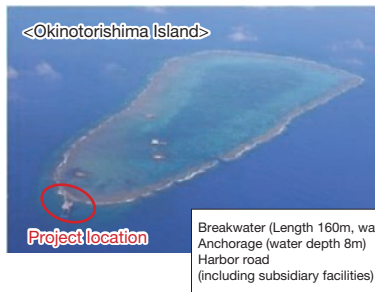
- In order to ensure that the development and usage of maritime resources and maritime research activities are implemented safely and steadily in waters located far away from the mainland, the MLIT Minister implements the development and management of port facilities (designated remote island port facilities: the development details are stated in the basic plan).

(Minamitorishima Island) Project started FY 2010

(Okinotorishima Island) Project started in FY 2011



<Exclusive Economic Zone and position of Minamitorishima Island and Okinotorishima Island>
(Quoted from the website of the marine information division of the Japan Coast Guard, with additions made)



<Okinotorishima Island>

Project location

Breakwater (Length 160m, water depth 8m)
Anchorage (water depth 8m)
Harbor road
(including subsidiary facilities)



<Minamitorishima Island>

Project location

Breakwater (Length 160m, water depth 8m)
Anchorage (water depth 8m)
(including subsidiary facilities)



<Patrol and Status Survey>

Source) MLIT

(iii) Developing and Managing Bases of Activities in Specified Remote Islands (Minamitorishima Island and Okinotorishima Island)

In accordance with the Low-Tide Preservation Act, port facilities are being developed in Minamitorishima Island and Okinotorishima Island, which are located in areas remote from the mainland, to enable the mooring and berthing of vessels and cargo handling as operational bases for the conservation and usage of the exclusive economic zone and continental shelf with a management system by the government being established.

Section 6 Protecting Territorial Land and Territorial Waters Firmly

(1) Situation in Recent Years

Intrusions into Japan's territorial waters around the Senkaku Islands by Chinese government vessels, etc. and sovereignty claims by activists of Chinese, Taiwanese and others have taken place in recent years. Especially, since September 2012, China's government-owned vessels navigated into the contiguous zone almost every day, except days of bad weather, and repeatedly intruded into the waters at a frequency of about three times a month. Moreover, foreign fishing vessels continue to operate in the same waters. Under the policy of protecting Japan's territories and waters at all cost, the Japan Coast Guard is responding to these circumstances in a calm but firm manner by taking such measures as deploying patrol vessels in the waters so that the situation will not escalate. In February 2016, a full-time security system for Senkaku waters by 14 large patrol vessels was established in order to make sure to be able to handle China's government-owned vessels in the waters surrounding the Senkaku Islands.

In the waters around the Ogasawara Islands, Chinese coral vessels, which were found in large numbers since September 2014, have not been detected after the detection in late January 2015. However, given that the situation is still unpredictable, with the subsequent occurrence of an arrest in the Japan's exclusive economic zone in the west Kyushu region, the Japan Coast Guard is continuing strict monitoring and crackdown in coordination with the Fisheries Agency and other relevant organizations.

Furthermore, in Japan's exclusive economic zone around the East China Sea, surveys and other activities of foreign ocean survey vessels without Japan's consent were found. The Japan Coast Guard is taking appropriate measures on a case-by-case basis according to the situation, such as by requesting suspension of such activities and ongoing monitoring by patrol vessels in coordination with relevant organizations.

The Japan Coast Guard established a system for full-time operations in the waters around the Senkaku Islands to ensure security of the territorial waters and crackdown on foreign fishing vessels in February 2016, and strives to develop strategic coast guard systems steadily in order to sufficiently and effectively respond to suspicious events, illegal activities and the like in the waters across Japan that include remote islands and territorial waters.

Figure II-2-6-1

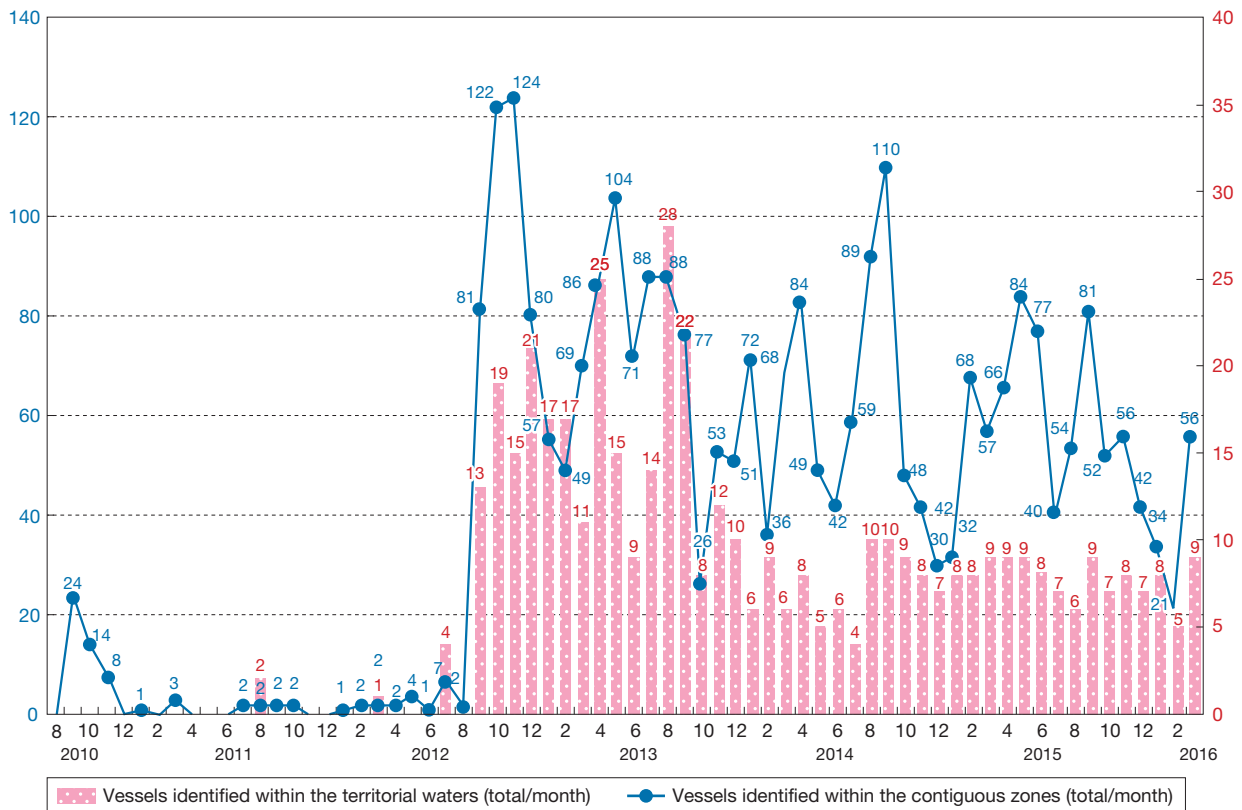
Patrol vessels dedicated to Senkaku waters security (patrol vessels Tarama, Ikema, Irabu)



(Source) MLIT

Figure II-2-6-2

Number of Chinese Government Vessels Entering the Contiguous Zones and Intruding into territorial waters



Status of Chinese government vessels intruding into territorial waters (as of the end of March 2016)
 • Intrusion into territorial waters: 147 cases (149 days) • Vessels intruding into territorial waters: 461
 • Maximum number of vessels intruding into territorial waters: 8 • Longest duration of intrusion into territorial waters: 28 hours 15 minutes
 (Source) MLIT

(2) Establishment of a Maritime Safety and Security Policy Program

For the peace and prosperity of the international community as a whole, it is critical to strengthen maritime order governed by law and rules and not by coercion as stated in the National Security Strategy adopted by a Cabinet decision in December 2013. To this end, effective support provided by the Japan Coast Guard to the maritime law enforcement organizations of other countries in strengthening their capabilities and deepening mutual understanding is expected to contribute to enhanced maritime order governed by law and rules. In October 2015, the world's first master's level program in maritime safety and security policy was opened for young high-ranking officials of the Japan Coast Guard and coast guard organizations of other Asian countries.

Figure II-2-6-3

Opening Ceremony of Maritime Safety and Security Policy Program



Source) MLIT

Section 7 Driving the Implementation of Water Cycle

1 Formulation of the Water Cycle Basic Plan

The Basic Act on Water Cycle, which was promulgated in April 2014 and enacted in July of the same year, stipulates the establishment of the Water Cycle Basic Plan in order to promote water cycle measures in a comprehensive and systematic manner; at the first meeting of the Headquarters for Water Cycle Policy on July 18, 2014, Prime Minister Abe instructed the earliest possible formulation of the plan by the summer of 2015. Since then, the secretariat of the Headquarters for Water Cycle Policy examined the Water Cycle Basic Plan while listening to the opinions of experts and the public and coordinating with government agencies, and the plan was adopted by a Cabinet decision after the second meeting of the Headquarters for Water Cycle Policy on July 10, 2015. The Water Cycle Basic Plan aims to comprehensively and systematically push forward nine measures, including promotion of river basin coordination, maintenance and enhancement of storage and groundwater recharging functions, facilitation of proper and effective use of water, promotion of education on sound water cycle and voluntary activities of private organizations, implementation of surveys and promotion of science and technology, securing international coordination and promoting international cooperation, and developing water cycle related talents.

Especially, defining River Basin Management as coordinated activity of relevant parties through water cycle-related measures aimed at maintaining and improving natural environments that concern human activities, water volume and quality and water in forests, rivers, agricultural land, cities, lakes, coastal area and the like in river basins; in order to facilitate the activity, we will establish the river basin water cycle council according to regional circumstances, establish the River Basin Water Cycle Plan that sets forth basic policy on the River Basin Management, and strive to realize appropriate conservation and management with coordination among public organizations that shall include relevant administrative agencies, business operators, organizations, and residents.

Figure II-2-7-1 Summary of the Basic Act on Water Cycle

Outline of Basic Plan on Water Cycle	
General 1 Our Relations with the Water Cycle 2 Definition, Period and Structure of the Basic Plan on Water Cycle	(4) Efficient and effective water use (5) Water environment (6) Water environment and ecosystems (7) Waterfront spaces (8) Water culture (9) Water environment and global warming
Part 1 Basic Policy of Water Cycle Measures 1 Comprehensive and Integrated River Basin Management 2 Approach to Maintain/Restore Sound Water Cycles 3 Adequate Use and Benefits of Water 4 Maintenance of Sound Water Cycles in Water Use 5 Actions Concerning Water Cycle under International Cooperation	4 Education of Sound Water Cycles (1) Promotion of water cycle education (2) Raising awareness of water cycles 5 Voluntary Activities by Private Entities 6 Research for Developing and Implementing Water Cycle Measures (1) Research on the current situation of water cycles in river basins (2) Research on the effect of climate change on water cycles and adaptability
Part 2 Comprehensive and Systematic Measures on Water Cycles Implemented by the Government 1 River Basin Cooperation -Framework for Comprehensive and Integrated River Basin Management- (1) River basin area (2) Concepts of comprehensive and integrated river basin management (3) River basin water cycle council and river basin water cycle plan (4) Contents of River basin water cycle plan (5) Development process and assessment of the river basin water cycle plan (6) Measures for developing and promoting the river basin water cycle plan 2 Maintenance and improvement of Water Retention/Recharge Function (1) Forests (2) Rivers (3) Farmland (4) Cities 3 Adequate and Effective Water Use (1) Stable water supply and drainage (2) Sustainable maintenance and use of groundwater (3) Strategic maintenance, management and renewal of water infrastructure	7 Promotion of Science and Technology 8 International Partnerships and Cooperation (1) International partnerships (2) International cooperation (3) Overseas expansion of water business 9 Human Resource Development in Water Cycles (1) Human resource development and international personnel exchange under industry-academic-government collaboration
	Part 3 Requirements for the Comprehensive and Systematic Promotion of Measures on Water Cycles 1 Effective Measures on Water Cycles 2 Responsibilities, Collaboration and Cooperation of Stakeholders 3 Announcement of Measures on Water Cycles

Source) MLIT

2 Future Initiatives on Water Cycle Policy

Going forward, under the Headquarters for Water Cycle Policy, the MLIT will push forward various measures of the Water Cycle Basic Plan in an efficient and effective manner in coordination with water cycle related government agencies while establishing coordination structures at the regional levels.

Section 8 Efficient, Prioritized Deployment of Measures

1 Efforts to Improve Productivity in Construction Production Systems Including “i-Construction”

As Japanese workforce continues to shrink as a whole, the need augments to automate, streamline and upgrade construction management system workflow for higher productivity while endeavoring to improve the cost structures in the successive stages of social infrastructure development planning, engineering, construction and management in order to develop social infrastructures efficiently and effectively for maximized social infrastructure stock effects and to assure their quality in the future. The MLIT promotes a variety of approaches that help improve productivity from perspectives of developing and utilizing new technologies and methods, leveling construction timings and maintaining fair construction periods, expediting communication, making efficient use of technicians and craftsmen.

In November 2015, it was decided to promote i-Construction, a new initiative aimed at drastic improvement in productivity in lagging areas that includes civil engineering and concrete work by working on three measures—full use of ICT, standardization of specifications and leveling of construction timing, thereby dramatically increasing the productivity per skilled worker of construction sites as a whole. In order to examine the basic policy and promotion measures to this end, the establishment of i-Construction Committee (chaired by Hiroshi Komiya, Chairman of Mitsubishi Research Institute) was announced. The i-Construction Committee met four times since December 2015, and broad opinions received were put together as a report in April 2016. Based on the report, positioning 2016 as the beginning year of productivity revolution, the MLIT will make all-out efforts to enhance productivity, increase each worker’s productivity

in construction sites, improve the operating environment of companies, and raise wage levels of people engaged in construction, while promoting safety.

2 Assuring Public Works Quality and developing and securing leaders

With the aim of ensuring the present and future quality of public works and developing and securing leaders of public works over the medium- to long-term, the Act for Promoting the Assurance of Quality of Public Works (Quality Assurance Act), the Act for Promoting Proper Tendering and Contracting for Public works (Tendering and Contracting Act), and the Construction Business Act were amended in June 2014 (the so-called Three Public Work Bearers Acts), and the amendment of the Basic Policy under Article 9 of the Quality Assurance Act and the Rationalization Guidelines under Article 17 of Contracting Act was adopted by a Cabinet decision in September 2014. Furthermore, the Guidelines on Implementation of Order Administration (Guidelines) under Article 22 of the Quality Assurance Act were established in January 2015 (agreement of the liaison committee of relevant ministries on the promotion of quality assurance in public works). FY 2015 marked the first year for full-scale implementation of the Three Public Works Bearers Acts with starting of order administration based on the Guideline and the full enactment of the Tendering and Contracting Act, and all orderers of public works that include municipalities are required to work on specific initiatives based on the Guidelines. Going forward, the MLIT will periodically conduct surveys on whether order administration is appropriately implemented by the orderers based on the Guidelines and put together the results for publication.

Figure II-2-8-1 Key Points of the Guidelines on Implementation of Order Administration (Guidelines)

Key Points of the Guidelines on Implementation of Order Administration (Guidelines)	
<p>The national government prepared the Guidelines under Article 22 of the Quality Assurance Act, listening to the opinions of local governments, academic experts and private business operators and others.</p> <ul style="list-style-type: none"> ➢ The Guidelines were put together in a systematic manner as common guidelines for orderers so that they can operate order administration appropriately and efficiently. ➢ The national government periodically conducts survey on whether order administration is conducted appropriately in accordance with the Guidelines, and puts together the results for publication. 	
Mandatory action items	Action items to work on
<p>Appropriate setting of predetermined prices</p> <p>In setting predetermined prices, estimates must correctly reflect transaction prices of labor, materials and the like in the market as well as state of affairs of construction so that appropriate profits will be secured. In calculating estimates, the up-to-date estimation standards should be used on the assumption of a proper construction period.</p>	<p>Selection and use of tendering and contracting methods according to the characteristics and other factors of works</p> <p>Orderers select appropriate tendering and contracting methods among various methods according to the characteristics of works and regional conditions, or apply a combination of methods.</p>
<p>Elimination of <i>Bugiri</i> practice</p> <p>The <i>fugiri</i> practice must not be conducted as it violates the provisions of Article 7, Paragraph 1, Item 1, of the Act for Promoting the Assurance of Quality of Public Works.</p>	<p>Leveling of order and construction periods</p> <p>The leveling of ordering and construction periods should be aimed for by devising better ways in budget execution such as actively leveraging the multi-year budget system and ensuring budget execution from the first fiscal year as well as devising ways in contracting such as setting leeway periods, and by setting construction periods that take into consideration non-operating days by securing two days off a week.</p>
<p>Ensuring setting up and use of survey standards on low bid prices or the lowest price limits.</p> <p>In order to prevent the practice of winning orders by presenting extremely low prices, appropriate use of the low bid price survey system or the lowest price limit system must be ensured. In principle, predetermined prices are published after bidding.</p>	<p>Use of quotations</p> <p>In the case of inviting bids, if a gap between a standard estimate and actual situations at construction sites is assumed such as when there has been no bidder or successful bid, predetermined prices should be reviewed appropriately by using quotations.</p>
<p>Appropriate design changes</p> <p>If construction conditions and actual state of construction sites do not match or there are other similar situations, the design documents and associated contract prices and construction period must be changed appropriately.</p>	<p>Expediting information sharing and discussions with contractors</p> <p>Orderers strive to respond to consultation from contractors speedily and appropriately. Hold meetings of all relevant parties of both orderers and contractors as necessary to discuss and deliberate the appropriateness of the design changes and suspension of construction works and the like with the aim of expediting design change procedures.</p>
<p>Establishment of a system for supporting among orderers</p> <p>In addition to capturing the order administration status of orderers through the regional council of orderers, orderers make necessary coordination and adjustments, and municipalities and other orderers that require assistance seek support of the national and prefectural governments through the regional council of orderers.</p>	<p>Confirmation and evaluation of construction status after elapse of specified periods after completion</p> <p>Implement confirmation and evaluation of construction status as necessary after elapse of specified periods after completion.</p>

Source) MLIT

(1) Approaches to fulfilling duty of orders

The Guidelines systemically put together each stage of order administration—survey and design, preparation for ordering construction projects, tendering and contracting, construction and completion—as well as selection and use of various tendering and contracting methods, so that orderers are able to implement order administration in an appropriate and efficient manner in light of orderers' responsibilities. The MLIT is taking various initiatives for the appropriate implementation of order administration based on the Guidelines.

In the area of appropriate setting of predetermined prices, as an effort to eliminate the so-called *bugiri*, which is the practice of deducting part of construction specification amounts that are based on fair estimation, the MLIT has surveyed local governments four times with respect to the state of affairs and reasons for conducting *bugiri*, and requested the local governments that engaged in *bugiri* to rectify the practice at an early state through every opportunity. As the result, all local governments (459 organizations) that engaged in *bugiri* as of January 2015 due to precedents, fiscal reforms of municipalities, and other reasons decided to abolish the practice as of April 2016. Also, the MLIT is striving to establish and promulgate up-to-date standards and manuals concerning estimations. In regards to appropriate design changes, we aim for appropriate stipulation of construction conditions in design documents, as well as appropriate changes of design documents if deemed necessary, and revised the Guidelines on Design Changes. In regards to leveling of construction timing, we strive to achieve it by, among other measures, promoting systematic order placements, setting appropriate construction periods, and utilizing the system of allowing leeway periods.

(2) Review of varied tendering and contracting options, etc.

New additions to the Quality Assurance Act include the selection and utilization of varied tendering and contracting options (Article 14), phased screening system (Article 16), technical proposal integrated negotiation system (Article 18) and system that contributes for maintenance and management of regional social capital (multi-year contract, bulk orders, joint order acceptance) (Article 20). The MLIT has worked to explore recommended sequences of processes from planning of the development of social infrastructures to their engineering, construction, and management to orderers' viewpoints and responses to various issues occurring since November 2013 at the "Conference on How Future Construction Production

and Management Systems Should Be to Fulfill Purchasers' Liabilities." Based on the discussions at the Conference, the MLIT puts together the Guidelines for Applying Tendering and Contracting Methods to Public Works Projects to show how to apply tendering and contracting methods according to the characteristics of projects in May 2015.

(3) Coordination and Support among Orderers

In order to ensure the effectiveness of the Guidelines, the MLIT works to enhance coordination among orderers through the regional council of orderers and the coordination meeting on public works contracts, and pushes forward handling of shared issues of orderers and various measures. Specifically, we reviewed the structure of the regional council of orderers by establishing prefectural working groups, setting up various consultation desks at Regional Development Bureaus, and creating the headquarters for supporting orderers of public works headed by Development Bureaus and the like.

Section 9 Forming a New Phase of Relationships between the Central and Local Governments and Private Sectors

1 New Phase of Relationships between the Central and Local Governments

Based on appropriate division of roles between the central and regional governments, the MLIT promotes decentralization by transferring administration and authority in responding to important issues that include the formation of a vibrant economic society and regions. In FY 2014, a proposal solicitation program has started to invite local governments to submit their own proposals and explore ways to implement them with the aim of promoting new initiatives based on proposals of local governments. As a result, response policies were adopted by a Cabinet decision, and matters that require amendments to the laws were incorporated in the Act Concerning Establishment of Relevant Laws to Promote Reforms to Enhance Regional Autonomy and Independence (the Fifth Omnibus Decentralization Act), thereby revising obligations and frameworks, including the removal of the requirement to obtain consent of the prefectural governor when municipalities assign building officials. Examination results of FY 2015 were adopted as response policies by a Cabinet decision, and the sixth omnibus decentralization bill, which includes the provision that enables municipalities to develop their own plans for securing stable residency for the elderly was submitted to the Diet.

2 Driving Public-Private Partnerships, etc.

In order to promote the forming of specific projects towards the expansion of PPP/PFI markets, the MLIT subsidizes local governments and facilitates the formation of forums for industry-academia- finance-government discussions (regional platform) aimed at sharing and acquiring expertise and enhancing coordination between relevant parties. In FY 2015, the MLIT adopted 20 pioneering PPP projects and 12 public-private partnership projects for earthquake reconstruction. The MLIT provided support, for example, in conducting surveys in Sanjo-shi, Niigata, on the ideal ways of comprehensively contracting out multiple public facilities under different jurisdictions to the private sector. Also, a meeting was set up for eight blocks across Japan for core members of each regional platform consisting of local governments that have at least 200,000 people, universities, companies, regional banks, and other organizations.

Section 10 Policy Evaluations, Project Evaluations, and Interactive Administration

1 Driving Policy Evaluations

Based on the MLIT Basic Plan for Policy Evaluations under the Government Policy Evaluations Act, the MLIT uses three basic policy evaluation methods—(i) checking policies by periodically measuring and evaluating the achievement of each measure, (ii) reviewing policies by conducting in-depth analysis on specific focused themes and (iii) conducting policy assessment by analyzing the necessity of new measures—and runs management cycles for policies by linking those methods. In FY 2015, (i) 13 policy objectives/44 measure goals/166 performance indicators, (ii) 4 themes and (iii) 24 new measures were evaluated by respective systems ^{Note 1}. In addition, policy evaluation of individual public-works projects, individual research and development issues, regulations, and special taxation measures are conducted as a method of policy evaluation according to the characteristics of policies, and the results of the evaluation are reflected in budget request and development of new measures. Also, in accordance with the Act on General Rules for Incorporated Administrative Agencies as amended in June 2014, the first performance evaluation of 19 incorporated administrative agencies as the competent minister was performed.

2 Implementation of Project Evaluations

A fully integrated scheme of evaluating individual public-works projects is built in place to enhance the efficiency and transparency of their implementation. Under this scheme, new public-works projects are evaluated upon initial adoption and then reevaluated and post-evaluated upon completion. Project appraisal charts organized to present a background of the evaluations of public-works projects, including supporting data relevant to their cost effective analyses upon initial adoption, reevaluation, and post-evaluation upon completion and posted on the Internet and elsewhere. Furthermore, starting from FY 2015, maintenance costs are specified in evaluation reports for projects under direct control for further visibility ^{Note 2}. Furthermore, the MLIT conducts planning-phase evaluations on public-works projects implemented under its direct control as its own approach in the preliminary phase of new project evaluation upon initial adoption.

3 Driving Administrative Management Open to the Public, and Interactive Administration

(1) MLIT Hotline Station

In driving the land, infrastructure, transport, and tourism administration that has a very close bearing on people's living, it would be essential to gain a broad insight into people's views, requests and so on and deploy administrative actions directly related to the people. To this end, the MLIT has opened the MLIT Hotline Station to receive about 1,100 views on a monthly average.

(2) Keeping consumers informed

The MLIT has opened the Negative Information Search Site at its website to provide a summary listing of the records of contractors, etc. relating to buildings, such as housing, and public transportation facilities, including administrative dispositions imposed on them, to ensure safety and security through proper selection by consumers, etc. and supervision by markets, as well as by administration as in the past.

Note 1 Ministry of Land, Infrastructure and Transport and Tourism Policy Evaluations Website: <http://www.mlit.go.jp/seisakutokatsu/hyouka/index.html>

Note 2 Project Appraisal Website: <http://www.mlit.go.jp/tec/hyouka/public/index.html>
Project Appraisal Chart: <http://www.mlit.go.jp/tec/hyouka/public/jghks/chart.htm>

(3) Making the planning process in the development of social infrastructures more transparent

In driving the development of social infrastructures, it is important to ensure the transparency and fairness of the planning process and win understanding and cooperation from the local residents. The MLIT is working to make the planning process more transparent by using guidelines that stipulate present key conceptual approaches to formulating plans efficiently with socioeconomic, environmental, and all other relevant perspectives taken into consideration while encouraging the participation of various entities, including local residents, in the process.

Section 11 Approaches to Hosting Tokyo 2020 Olympic and Paralympic Games

Act on Special Measures for the 2020 Tokyo Olympics and Paralympics was enacted on June 25, 2015, and the government has established promotion headquarters to contribute to smooth preparation toward Tokyo Olympics and Paralympics to be held in 2020. Also, in accordance with the Act, the Basic Policy was adopted on November 27, 2015, by a Cabinet decision. The MLIT launched the MLIT Preparatory Headquarters for the 2020 Olympic and Paralympic Games headed by the MLIT Minister on April 18, 2014 to render all-out assistance.

It will take whatsoever responses necessary to get the Games running smoothly, including assuring safety and keeping lodgings and transportation comfortable. It will also move ahead with necessary approaches to realize the future visions of a Tokyo and Japan defined for the Grand Design of National Spatial Development Towards 2050, instead of viewing the year 2020 as a goal. Further, the MLIT is keen to lure foreign visitors into every little locality of the land of Japan to help make for its buoyancy as we conduct the Games not only in Tokyo but nationwide.

Specifically, the MLIT will, in coordination with the game committee and Tokyo, work on such measures as the development of road transportation infrastructures (section between Okegawa-Kitamoto IC and Shiraoka-Shobu IC on the Ken-O Expressway was opened on October 31, 2015), enhancement of the functionalities of metropolitan airports that are Japan's gateway, strengthening of barrier-free measures (the MLIT put together comprehensive measures of the ministry in August 2015), development of the environment for receiving foreign travelers that include multi-language information signs/maps and free public wireless LAN, improvement of the waterfront environment, disaster-prevention measures against typhoons and other disasters, security measures, such as maritime security, and issuance of special license plates.

Chapter 3

Realizing a Tourism Nation and Building a Beautiful Nation

Section 1 Trends in Tourism

1 Significance of a Tourism Nation

Tourism is an industrial segment of vital importance to Japan, for it helps the nation maintain regional vitalities to keep up with its social development by capturing global demands, as from rapidly advancing Asian nations, to expand nonresident population visting from both at home and abroad in a depopulating and aging society with falling birthrates, and also consolidate its position in an international community by promoting deeper global mutual understanding through two-way exchanges with the nations abroad.

2 Tourism Now

(1) Trends in the nation's tourism

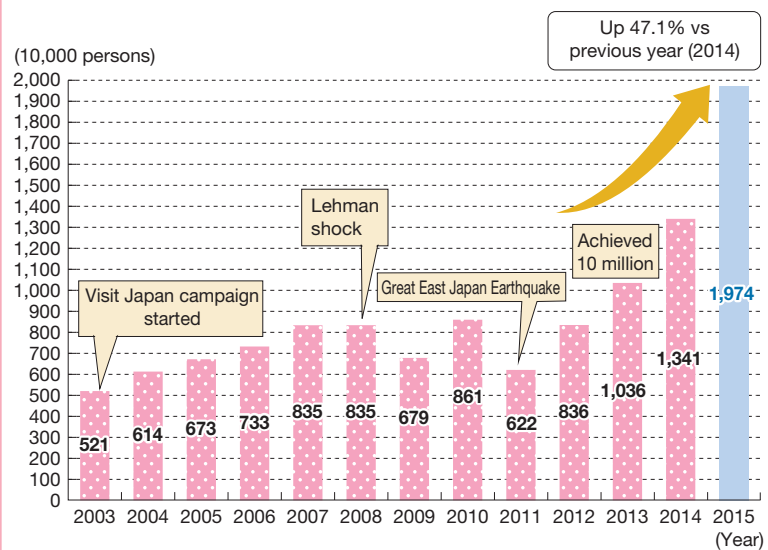
The number of domestic overnight travels for sightseeing made in 2015 averaged 2.45 per capita (against 2.06 a year earlier) and the average number of trips per capita was 1.45 times (against 1.26 a year earlier). Spending on the domestic overnight travels, including homecoming and business trips, amounted to about 16.5 trillion yen (against 14.4 trillion yen a year earlier), and the number of overnight stays, the number of trips taken and the amount of spending all increased from their year earlier levels.

The number of Japanese overseas travelers in 2015 decreased 4.1% (about 700,000 persons) from the previous year to about 16.22 million with their overseas travel consumption in the same year falling from the previous year (about 4.3 trillion yen) to about 3.9 trillion yen.

(2) Trends in foreigners touring Japan

The number of foreign visitors in 2015 increased to 19.74 million (up 47.1% from the previous year), with the number of increase in the past three years exceeding 10 million. By nationality and region, China accounted for about 4.99 million (up 107.3% from the previous year), followed by South Korea with about 4.00 million (up 45.3% from the previous year) and Taiwan with about 3.68 million (up 29.9% from the previous year). By market, the following 19 markets registered their annual record highs: South Korea, China, Taiwan, Hong Kong, Thailand, Singapore, Malaysia, Indonesia, the Philippines, Vietnam, India, Australia, the United States, Canada, the United Kingdom, France, Germany, Italy, and Spain.

Figure II-3-1-1 Change in the Number of Foreign visitors



(Note) Definite values for 2014 and before and preliminary value for 2015.
Source) Japan National Tourist Organization (JNTO)

With increases in the number of foreign visitors, they spent an all-time high of 3,477.1 billion yen in 2015, an advance of 71.5% (1,449.3 billion yen) from 2014.

(3) Trends in the tourism industry

(i) Travel trade

In FY 2015, Japan's 50 major travel agencies had a total transaction value of 6,636.3 billion yen (against 103.2% a year earlier), broken down into approximately 2,018.6 billion yen (91.6%) for overseas trips, approximately 4,443.5 billion yen (108.3%) and approximately 174.2 billion yen (144%) for inbound foreigner tours.

(ii) Guestroom occupancy ratios at accommodation facilities (hotels and Japanese inns)

The guestroom occupancy ratios (preliminary figures) at the hotels and Japanese inns in 2015 were 79.9% for city hotels (against 77.3% a year earlier), 57.3% (54.0%) for resort hotels, 75.1% (72.1%) for business hotels and 37.8% (35.2%) for Japanese inns.

Section 2 Approaches to Forging Tourism Nation

At the Ministerial Council on the Promotion of Japan as a Tourism-Oriented Country hosted by the prime minister, 2015 Action Program Toward the Realization of Japan as a Tourism-Oriented Country was decided in June 2015, and united efforts of the government in cooperation with the private sector were made toward the realization of a tourism nation.

1 Strategic Initiatives Toward a New Inbound Tourism Era

Starting from 2015, JNTO (Japan National Tourist Organization) became the implementing entity of the Visit Japan Campaign, which was previously carried out by the Japan Tourism Agency, and is conducting effective visit Japan promotions, leveraging its local networks overseas. It disseminated attractions of regions in the countryside to allure inbound foreign tourists concentrated in Tokyo, Kyoto, Osaka, and other cities in the so-called golden route. Also, in order to create demand for inbound tourism throughout the year, JNTO communicated the charms of four seasons such as winter snow, in addition to spring cherry blossoms and autumn leaves.

The MLIT worked to relax visa requirements in coordination with relevant ministries. Multiple-entry visas were introduced for Brazilians on June 15, 2015 and for Mongolians on August 10 of the same year, followed by the significant relaxation of requirements for multiple-entry visas for Indians on January 11, 2016 and the extension of validity of multiple-entry visas for Vietnamese and Indians (e.g., for business, cultural and intellectual persons) on February 15, 2016 which was the Japan's first case of introducing a multiple-entry visa with a maximum validity of 10 years.

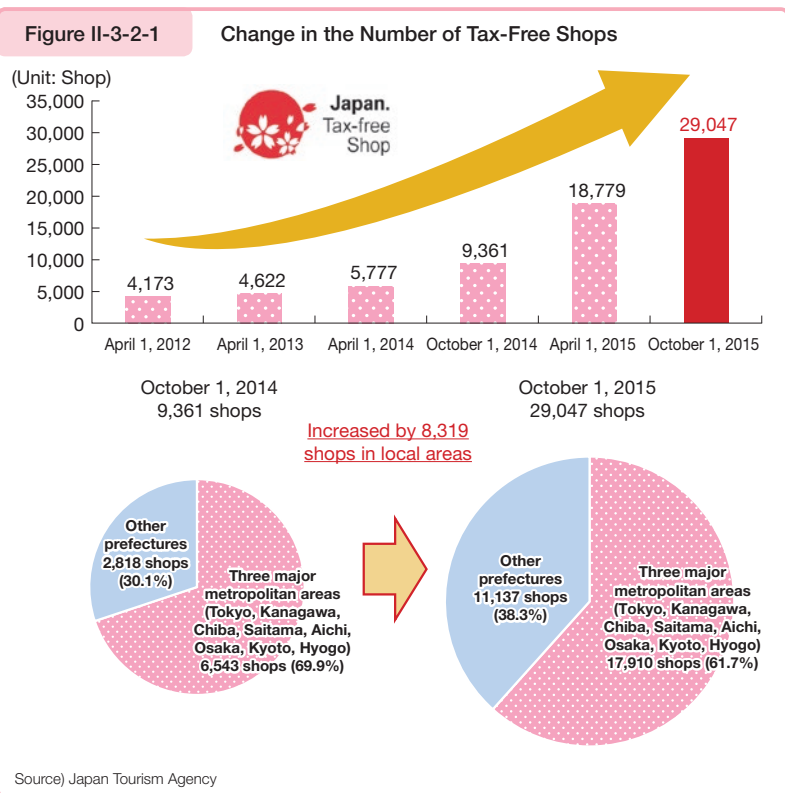
Furthermore, in order to tap the long-stay demand of wealthy foreigners, the "longer stays program for sightseeing" was introduced on June 23, 2015.

2 Increasing Consumption of Foreign Visitors, Tapping Demand for Wide-Ranging Tourism-Related Industries and Strengthening the Tourism Industry

(1) Expansion of the Consumption Tax-Free System for Foreign Visitors

We have made expansion of the consumption tax-free system for foreign visitors, such as by expanding the range of tax-free items and introducing the system of tax-free procedure counters in shopping streets etc. Due to these efforts, the number of tax-free shops increased from 5,777 in April 2014 to 29,047 in October 2015.

In the FY 2016 tax reform, the system was further expanded from the perspective of increasing consumption in the countryside, including the reduction of the lower limit purchase amount for general goods.



(2) Enhancing the Appeals of Shopping by Expanding Bonded Shops in Cities

In FY 2015, two bonded shops (airport-type duty-free shops) were opened in Ginza, Tokyo and started the services that enable travelers who purchase goods in these bonded shops to receive them at Haneda Airport and Narita Airport.

(3) Developing Talent to Revitalize and Improve Productivity in the Tourism Industry

Management talent development courses were opened in collaboration with regional universities for senior management and managers of Japanese inns and hotels who play important roles in regional economies. In addition, an internship model project was carried out for college students with help from tourism-related bodies and enterprises to help them develop a better understanding of the tourism industry and brew a sense of employment in it.

Furthermore, in order to facilitate the engagement by foreigners in Japan in the tourism industry, approaches to the application of the status of residence and specific examples of cases where work is permitted or not permitted were posted on the website of the Ministry of Justice for foreigners wishing to work at accommodation facilities. Also, given that the number of foreign travelers who enjoy real skiing is increasing, the status of residence requirements for foreign ski instructors in lieu of the years of practical experience were examined after surveying persons related to ski resorts on the status of residence requirements, and it was decided to approve certain qualifications of ski instructors as alternative requirements. As for tour operators that make travel arrangements for foreign travelers, the Japan Tourism Agency promoted the certification system operated by Japan Association of Travel Agents (JATA) as secretariat for indicating the levels of service quality and reliability of companies, as well as certified business operators by the system.

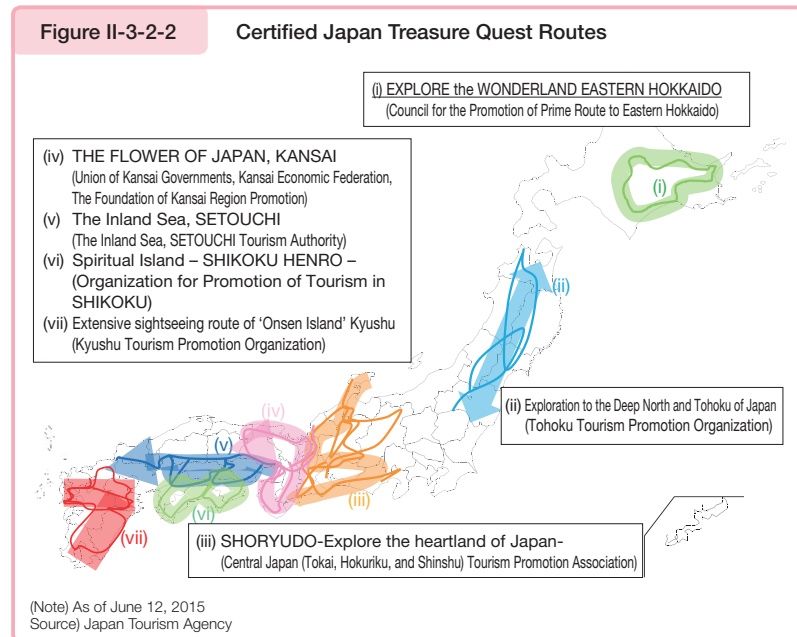
3 Creation of Tourism Areas that Contribute to Regional Revitalization and Development of Domestic Tourism

(1) Developing attractive tourism areas with high international competitiveness

In order to create tourism areas with outstanding attractions that appeal to people inside and outside Japan with specified themes, three tourism zones including Kagawa Setouchi Art Tourism Zone were certified and received business support in FY 2015 as areas that can respond to stay-and-exchange type tourism in accordance with the Act on Promotion of Tourists' Visit and Stay Through Development of Tourism Areas.

Also, the aim of development of extensive sightseeing routes (broad sightseeing flow lines) according to the number of days travelers from overseas are staying in Japan by creating a network of the most attractive sightseeing spots in many prefectures based on themes and

stories, taking transportation access into account, and to positively disseminate it overseas to attract visitors to Japan, and seven routes across Japan were newly certified in FY 2015 in an effort to support regional initiatives.



(2) Supporting the development of tourism areas that leverages tourist resources

It is necessary to create tourism areas that leverage tourism resources, such as historical sceneries, beautiful nature, marine resources, rich and varied rural areas, and attractive food culture, and appeal to various needs of travelers.

To this end, we decided to support measures for developing regions that leverage their tourism resources and for reviving tourism such as by improving the environment to receive tourists and enhancing secondary transportation, in a unified manner in FY 2015. Leveraging this project, we supported the development of tourism in 30 regions across Japan including the industrial tourism that uses Arita ware of Arita-cho and the residential tourism having the Tomioka Silk Mill in Tomioka-shi, Gunma Prefecture at its core.

About 80% of all Michi-no-Ekis across Japan are furnished with a tourist information center, which not only serves as a gateway for first-time visitors to the localities but as a site to host optional tours. In FY 2015, we started installing free public WiFi at Michi-no-ekis (called Michi-no-eki SPOT) and information centers in coordination with the Japan Tourism Agency to provide easier access to road traffic information and enhance tourist information for inbound foreign visitors. Furthermore, starting from FY 2015, we are working to improve tourist spot signs by indicating names of tourist spots on intersection signs placed at the entrance of adjacent or access roads to tourist spots so that tourist spot signs will become easier to understand.

4 Proactive Improvement of the Environment to Receive Tourists

Establishing an environment for comfortable and smooth transportation and stay is critical in terms of being well prepared to receive rapidly increasing number of foreign travelers and ensuring that they are satisfied with their visit and become repeated visitors.

(1) Securing supply of accommodation facilities

With the aim of addressing the continued tight supply of accommodations mainly for hotels in urban areas due to a rapid increase in the number of inbound foreign visitors, Japanese inns and accommodations in the countryside that were not operating at full capacity in terms of room occupancy ratios improved their facilities in an effort to attract foreign guests to them, such as by establishing the Wi-Fi environment and changing toilets to western-style one. Also, information on various Japanese accommodation facilities targeted to foreign travelers was disseminated via the JNTO website in addition to enhancing the provision of vacancy information at information centers and facilities for attracting visitors. With respect to *minpaku* (private residence accommodation) services, the MLIT and the Ministry of Health, Labour and Welfare (MHLW) jointly launched a review meeting on *minpaku* services in November 2015, which will reach conclusions within June 2016 to establish necessary laws.

(2) Strengthening multilingual services and tourism information

As for multilingual support, in coordination with relevant ministers, we pushed forward initiatives to ensure consistency and continuity of markings used in a broad range of facilities, such as art galleries, museums, natural parks, tourist sites, roads and public transport facilities in accordance with common guidelines for multilingual services formulated and published in March 2014. For example, we improved road information signs to include English in 49 major tourist sites nationwide and other places in coordination with information signs of various organizations to guide inbound foreign visitors appropriately. Furthermore, the committee for appropriate road signs of each prefecture coordinated with relevant organizations so that road information signs will be consistent with English indications of road related facilities and names of places, such as mountains used in information signs and the English map at the scale of 1:1,000,000 prepared by the Geospatial Information Authority of Japan.

In addition, as the result of working to further enhance JNTO certified information centers for foreign travelers, category 2 or above foreign tourist information centers that provide wide-area tourist information were established in all prefectures in FY 2015.

(3) Review of the guide interpreter system

In regard to the guide interpreter system, the Act on Special Zones for Structural Reform was amended in September 2015 to meet regional needs, and a newly created system for regional special guides was adopted in Kyoto-shi, Takayama-shi and other cities.

(4) Improvement of communications environment for foreign travelers such as pushing forward the establishment of the free public wireless LAN environment

The MLIT set up the council for promoting free public wireless LAN in coordination with the Ministry of Internal Affairs and Communications, and pushed forward the further improvement of the free public wireless LAN environment, dissemination and promotion by introducing common symbol marks, and simplifying authentication procedures with the aim of creating an environment where foreign travelers can walk around on their own. Also, with the aim of promoting the use of SIM cards and mobile Wi-Fi routers, a campaign for expanding available areas and increasing recognition was conducted from December 2015.

(5) Securing the security and safety of foreign travelers

Prefectural governments selected medical institutions that can receive foreign travelers and treat a wide-variety of cases based on the requirements presented by the Japan Tourism Agency and the MHLW. The list of about 320 medical institutions selected as such was put together and disseminated in March 2016. Furthermore, as the result of calling for the development of travel insurance that foreign travelers can subscribe to after visiting Japan so that they can receive treatment without worrying about medical insurance, nonlife insurance companies are now working on the development of such products.

(6) Improving the environment to receive cruise ships

In response to requests from foreign shipping companies, the website for centrally disseminating specifications of port facilities and tourist information around ports of call was enhanced in cooperation with the National Cruise Vitalization

Conference. Also, meetings for business negotiations participated by cruise shipping companies, port administrators, and the like were held and the establishment of the notification system for temporary tax-free shops at cruise piers was promoted. As the result of these efforts, the era of welcoming 1 million foreign visitors by cruise ships was achieved five years ahead of the plan.

(7) Promotion for receiving more Muslim travelers

In order to promote visits from Islamic countries to Japan, the guidebook for welcoming Muslims was published in August 2015 and support was provided to initiatives of regions motivated to receive Muslim travelers.

Other initiatives taken include expediting and facilitating the procedural flow of immigration at airports and ports toward improved CIQ, enhancing the means of secondary transportation, improving the payment environment, such as promoting the installation of ATMs where credit cards issued overseas can be used, and encouraging Hands-Free Travel for inbound foreign tourists by introducing logo marks indicating the Hands-Free Travel service bases and expansion of service bases utilizing the marks, and strengthening information provision to inbound foreign travelers at times of disaster event.

Also, regional outposts of the MLIT led efforts to resolve specific regional issues at the Tourism strategy meeting in each regional block toward receiving 20 million inbound foreign tourists (established in March 2015) in enhancing the structure to receive the surging number of inbound foreign tourists.



5 Attracting Foreign Business guests and Others, High Quality Tourism Exchanges

(1) Attracting foreign business guests

In order to expedite immigration procedures for participants in international conferences and important business travelers, fast lanes were set up at Narita International Airport and Kansai International Airport in March 2016 as a starter. Furthermore, necessary preparations and examinations are underway for the implementation of a system within 2016 for identifying frequent foreign visitors to Japan with low immigration control risk as trusted travelers and make them subject to automation gates. Also, the environment for receiving business jets was improved by, among other measures, advancing the monthly application deadline and finalization date for flight schedules at Haneda Airport (advanced by five days) and increasing the spots where business jets are available at Narita Airport.

(2) Increasing international competitiveness in the area of MICE such as international conferences

In order to actively invite international conferences and other MICE events ^{Note}, (i) five cities were newly selected and received support as global MICE cities that can win tough competitions with overseas competitors; (ii) persons who have influence over academic conferences and the like inside and outside Japan and are engaged in specific projects to invite international conferences are certified as MICE Ambassadors; and (iii) use of unique venues that provide the sense of specialness and regional characteristics, such as by holding meetings and receptions at historical buildings and public spaces, were promoted. Also, by using the MICE brand Japan. Meetings & Events, efforts were made to increase recognition among overseas hosts at such occasions as overseas MICE trade fairs.



Note MICE is a collective term for business meetings (Meetings), incentive and study travels of businesses (Incentive), international conferences (Convention), and exhibitions and events (Exhibitions/Events).

As the result of these efforts, Japan was ranked top among Asian countries in the number of international conferences held for the third consecutive year, and holding of a series of large conferences in Japan was decided, including the 2016 annual world conference of the International Association for Impact Assessment (expected number of participants: 1,000) and the 25th General Conference of the International Council of Museums (expected number of participants: 2,500) in 2019.

6 Acceleration of Tourism Promotion, Having Post-Rio de Janeiro Games, 2020 Olympic and Paralympic Games and Post-2020 Games in Sight

(1) Visit Japan promotion taking the opportunities of large-scale international sports games

We participated in PRESENTING JAPAN, a public and private sector joint event, from October 24 through 30, 2015, taking the opportunity of the 2015 Rugby World Cup held in the UK. Effective visit Japan promotion was carried out to deepen the understanding of Japan by disseminating Japan's travel information to rugby fans and the media gathered from all over the world by such means as airing videos for promoting visit to Japan and setting up a tourism concierge booth.

(2) Accelerating a barrier-free environment taking the opportunity of hosting Olympic and Paralympic Games

We have enhanced activities aimed at creating an environment in which all people, including elderly people and people with disabilities, can enjoy touring. These activities included provision of integrated regional consultation services in multiple languages. In addition, efforts were made to spread the universal tourism further, conducting surveys and reviews on travelers with small children and expectant mothers.

(3) Establishing an environment to receive foreign tourists who visit Japan for Olympic and Paralympic Games

In coordination with the Council of Multilingual Services for the 2020 Olympic and Paralympic Games, we have improved and enhanced multilingual services and shared cases to be followed.

Also, the Toei Subway and others started the provision of the free public wireless LAN environment from FY 2015 due to encouragement leveraging the framework of the Free Public Wireless LAN Development Promotion Conference. From FY 2016, the provision will start in other places including the Tokyo Metro.

At Tokyo Station, surveys were conducted on the status regarding the ease of understanding and continuity of information signs: a review meeting to examine improvements from the viewpoints of people with restricted movement such as those who have disabilities was held, and measures to improve information signs were put together.

In January 2016, the Tokyo section of the committee for appropriate road signs formulated for Tokyo the Policy on Road Sign Improvements toward Tokyo 2020 Olympic and Paralympic Games, and started working on improvements of road signs in Akihabara and Kamata (around Haneda Airport) in February of the same year. This included addition of English to signs, use of route numbers, use of pictograms and reversed characters, indication of common names and bigger font sizes, and enhancement of signs for pedestrians. In the neighboring prefectures (Chiba, Saitama, and Kanagawa), policies on road sign improvement were discussed.

7 New Tourism Strategy to Invigorate the Japanese Economy

As the achievement of 20 million foreign visitors is in sight, the Meeting of the Council for A Tourism Vision to support the future of Japan chaired by Prime Minister Abe was held on November 9, 2015, and the New Tourism Strategy to Invigorate the Japanese Economy (Tourism Strategy) was put together on March 30, 2016.

The Tourism Strategy sets new targets for the number of foreign visitors, amount of consumption by foreign visitors to Japan, total number of foreign lodgers in localities, the number of repeated foreign visitors, and the amount of domestic travel consumption by Japanese (e.g., 40 million foreign visitors by 2020 and 60 million by 2030, consumption by foreign visitors of 8 trillion yen by 2020 and 15 trillion yen by 2030). Also, with the awareness that tourism is truly the pillar of Japan's growth strategy and regional revitalization, 35 projects of measures in line with three vision were set out with the aim of becoming a developed country in tourism, and key measures among them were put together as 10 reforms.

(1) Vision 1: Maximizing the attractiveness of tourism resources in order to make tourism the base of regional revitalization

In order to refine the rich and various tourist resources of Japan with pride and communicate the value to foreigners in a easily understandable manner, we will work on, among other measures, to (i) boldly open appealing public facilities, including the Geihin-kan (State Guest House), to the wide public and the world as tourism attractions, (ii) drastically shift from prioritizing conservation of cultural properties to utilizing them by promoting understanding from tourists viewpoints, (iii) branding national parks, the condensed form of abundant nature to become the world-class national parks (iv) formulate the landscape plan in major tourist sites to make thorough improvements to create beautiful towns.

(2) Vision 2: Foster innovation in the tourism industry to boost its international competitiveness and develop it into a core industry

In order to change the tourism industry in ways that create regional jobs and grow people and become a highly productive and internationally competitive industry, we will (v) review the interpreter guide related regulations, which are established more than 60 years ago, to transform the tourism industry to emphasize productivity, (vi) develop new markets such as those for European, US and Australian tourists and the wealthy with the aim of improving the quality of tourism, thereby realizing long-stay and increased consumption at the same time, and (vii) revitalize and activate exhausted hot spring resort areas and regional towns and cities steadily through future-oriented management such as the formation of DMO ^{Note} and human resources development.

(3) Vision 3: Ensure all visitors may enjoy a satisfying, comfortable and stress-free sightseeing experience

In order to expedite the environment to receive travelers such as CIQ, accommodation facilities, communications, transportation and payment, and build society where all people, including elderly people and people with disabilities, can enjoy touring, we will work to (viii) realize the world most comfortable stay by drastically improving soft infrastructure in every aspect, including CIQ, communications, transportation, payment and barrier-free, (ix) realize comfortable travels across Japan by establishing "regional economic development corridor" plan leveraging high-speed transportation networks and (x) creating dynamic society by changing the ways of working and time off.

Note DMO Destination Management/Marketing Organizations

Column the Tourism strategy meeting in each regional block toward receiving 20 million inbound foreign tourists

In March 2015, in order to enhance structures to accept rapidly increasing inbound foreign tourists and promptly implement measures to solve regional issues, a liaison conference to accept 20 million inbound foreign tourists was organized in each of 10 regional blocks around the nation, consisting of regional offices of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), local governments, and related enterprises.

In December of the same year, each block put together the results and issues of its activities, and in February of this year, the blocks reported on the contents to the Tourism Nation Promotion Headquarters of MLIT (the 6th) headed by the Minister of Land, Infrastructure, Transport and Tourism. Some of the problem-solving cases in FY 2015 are introduced below.

○ Hokkaido Block

[Measures to supply a sufficient number of taxis at New Chitose Airport]

In order to respond to the increasing demand for taxis at New Chitose Airport from the increase in foreign travelers to Hokkaido, an official notice was issued by the Hokkaido District Transport Bureau in December 2015 to approve the expansion of the areas of operation for the taxi business associated with New Chitose Airport for the stable supply of taxis.



Source) Japan Tourism Agency

○ Kanto Block

[Measures to relieve the road congestion caused by chartered busses]

For the purpose of solving the problem of road congestion by chartered busses in Ginza, Akihabara, and other areas, a conference organization was established in December 2015, consisting of the Kanto District Transport Bureau, the Kanto Regional Development Bureau, the Tokyo metropolitan government, the Metropolitan Police Department, and enterprise organizations. In February 2016, campaigns to improve the manners of travel agencies and the chartered bus business were conducted.



Source) Japan Tourism Agency

○ Hokuriku Shinetsu Block

[Measures to install more coin-operated lockers in Kanazawa Station]

Because users of Kanazawa Station, including foreign travelers, have increased more rapidly than planned following the opening of the Hokuriku Shinkansen, more coin-operated lockers have been installed inside the station to solve the locker shortage in July 2015.



Source) Japan Tourism Agency

○ Chugoku Block

[Measures to improve the free public wireless LAN environment in Michi-no-ekis (Roadside Stations)]

In Michi-no-ekis (Roadside Stations) placed along national roads under the direct control of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) within the jurisdiction of the Chugoku Regional Development Bureau, the improvement project for Michi-no-eki SPOT, the free public wireless LAN service, was launched in December, 2015 to enhance the information transmission function in the Michi-no-ekis.



Source) MLIT

In FY 2016 as well, efforts are to be made to solve issues concerning the structures to accept inbound foreign tourists.

Column

Rules for English Translation of Japanese Geographical Names and Map Symbols for Overseas Visitors have been settled

• Introduction

In order to improve the environment for the efficient travel of inbound foreign tourists and to support realization of a tourism nation and uninterrupted delivery of the 2020 Tokyo Olympic and Paralympic Games, the Geospatial Information Authority of Japan (GSI) had considered the rules for translating Japanese geographical names into English and map symbols designed for overseas visitors as standards for creating foreign-language maps.

For this effort, public comments were invited for inclusion in the Working Rules for Operating Specifications, which stipulates standard methods of public surveys conducted by the government, local governments, and other agencies.

Based on the results, the rules for translation and 15 map symbols were determined at the end of March and published on the following website:

<http://www.gsi.go.jp/kihonjohochousa/kihonjohochousa60019.html>

• Rules for English Translation of Japanese Geographical Names

“Rules for English Translation of Japanese Geographical Names” identify how to translate Japanese geographical names such as those of mountains and rivers into English. Mainly, there are two methods of translation. The following are the characteristics of each method.

1. Substitution format

Like Mt. Tsukuba for Tsukuba-san, the san (mount) is replaced by “Mt”. Tone-gawa is translated as the Tone River. This method has less redundancy in the names and shows the names concisely on maps.

2. Addition format
















Like Mt. Gassan for Gassan, “Mt.” is added to the Japanese name written in Roman letters. If using the replacement method, Gassan becomes Mt. Gatsu, which is difficult for Japanese to understand. Similarly, for Arakawa, Arakawa River instead of Ara River is more easily communicated to the Japanese. The addition format is applied when the substitution format is hard to use, or Japanese cannot easily identify the original Japanese names from the English names translated by the substitution format.

The Rules for English Translation of Japanese Geographical Names summarize how to use each method properly.

• Map Symbols for Overseas Visitors

Map symbols designed for overseas visitors have been determined for 15 facilities frequently used by foreign visitors, such as hotels and restaurants.

Map Symbols for Overseas Visitors

Item	Symbol Decided	Item	Symbol Decided	Item	Symbol Decided
Post office		Hospital		Restaurant	
Police box (Koban)		Bank/ATM		Toilet	
Shrine		Shopping center / department store		Hot spring	
Church		Convenience store / supermarket		Railway station	
Museum		Hotel		Airport / airfield	

• Conclusion

The rules and symbols settled will be adopted as standards when GSI creates foreign-language maps and will be disseminated among local governments and map-making companies to facilitate their use.

Section 3 Building a Beautiful Nation Blessed with Pleasing Landscapes, etc.

1 Pleasing Landscape Formation

(1) Accelerating community development leveraged by the Landscape Act, etc.

Efforts to form pleasing landscapes have been accelerated by landscape administrative bodies ^{Note} based on the Landscape Act, which numbered 673 groups as of the end of September 2015, with 492 of them pursuing their own landscape plans. Further, the number of municipalities that formulated ministerial ordinances pursuant to the Outdoor Advertisement Act by becoming landscape administrative bodies rose to 68 groups as of the end of March 2016, and comprehensive formation of pleasing landscape is ongoing.

(2) Approaching landscape discussions as part of social capital development

To move ahead with landscape-conscious social capital development, a scheme of making post-project predictions and assessments of landscapes and factoring them into project plans while hearing diverse opinions from the local residents, academic experts and others has been pursued.

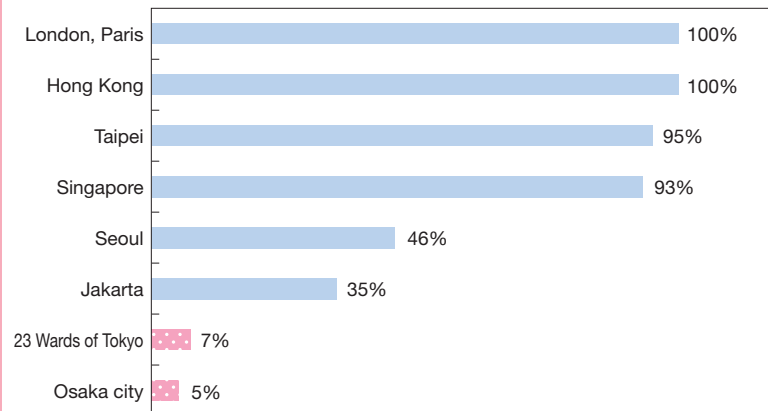
Note A landscape administrative body is a prefecture, government-ordinance-designated city, core city or any municipality that handles landscape administrative affairs (those based on the provisions of Section 1 to 4 of Chapter 2 and Chapters 4 and 5 of the Landscape Act) upon prior consultation with the governor of its prefecture.

(3) Accelerating removal of utility poles

From viewpoints of creating pleasing landscapes, promoting tourism, keeping driving environment safe and comfortable, making roads disasterprepared, we remove utility poles by promoting simultaneous development when constructing new roads or widening existing roads and implementing model construction works for introduction of lowcost methods.

Figure II-3-3-1

Present Status of Underground Utility Cables in Japan Compared with Major European and Asian cities



*1 2004 status for London and Paris surveyed by overseas power survey companies (in terms of total cable lengths)

*2 2004 status for Hong Kong surveyed by the Infrastructure Development Institute (in terms of total cable lengths)

*3 2013 status for Taipei surveyed by the MLIT (in road extension terms)

*4 1998 status for Singapore according to overseas electric industry statistics (in terms of total cable lengths)

*5 2011 status for Seoul surveyed by the MLIT (in terms of total cable lengths)

*6 2014 status for Jakarta surveyed by the MLIT (in road extension terms)

*7 End of FY 2013 status for Japan surveyed by the MLIT (in road extension terms)

Source) MLIT

(4) Driving the Japan Scenic Trails campaign

The Japan Scenic Trails campaign has been driven with the view of furthering roadside landscape designs and greening by leveraging regional resources and collaborating with various entities in order to help realize a tourism nation and contribute to regional revitalization. As of the end of March 2016, 138 routes were registered as Scenic Trails. Activities include those that help form pleasing landscapes and add to the charms of roadside localities by working in conjunction with Michi-no-Eki (Roadside Stations).

(5) Promoting the development of waterfront spaces, etc.

Practice of the concept of nature-rich river works has been promoted in all river restoration projects to preserve and create the habitat, growing and breeding environments of living organism inherent in rivers and diversities of river landscape while keeping the rivers in harmony with local livelihood, history, and cultures with their workings of nature taken into consideration. Also, in order to revitalize rivers and towns connected to them from the mouth of river to the source, we support the initiative of community development that utilizes rivers with coordination among municipalities, private businesses, local residents, and river administrators by promoting the formation of favorable spaces where rivers and towns integrate. Specifically, we provide support through the river environment project to preserve/restore and create a favorable river environment, exceptions of the permission rules on exclusive use for river sites for opening river spaces, water resource area vision that aims to revitalize water source regions leveraging dams, and Mizubering Project that provides the wide public with opportunities to find value in rivers.

Other ongoing efforts directed at regenerating and creating waterside environments from the facility spaces of sewage line and from sewage plant effluents include development of babbling water streams taking advantage of storm sewers and that of facilities for putting sewage plant effluents to use as babbling water. The conservation and creation of excellent waterside environments is also ensured by the implementation of appropriate wastewater treatment.

2 Community Development Leveraging Nature and History

(1) Developing National Government Parks to contribute to the preservation, utilization, etc. of Japan's indigenous cultures

The development of National Government Parks has been driven to ensure the preservation, utilization, etc. of Japan's superb indigenous cultures. A total of 17 National Government Parks are already open. In FY 2015, the area surrounding the Kitora Tumulus, etc. was refurbished in the Asuka Historical National Government Park (Asuka Zone).

(2) Preserving historic landscapes in ancient capitals

In Japan's ancient capital, such as Kyoto, Nara, and Kamakura, restrictions are placed on constructing new buildings, etc., making additions and modifications to existing ones, developing housing land and so on under the Act on Special Measures for Preservation of Historic Natural Features in Ancient Cities (Ancient Capitals Preservation Law). The Act also provides for the implementation of ancient city preservation projects, such as purchasing land, and publicity, educational and other activities, to help preserve historic landscapes in these cities.

(3) Preserving and utilizing historic public buildings of historical value, etc.

With the aim of contributing to regional town development, we are promoting the preservation and utilization of historic government facilities locally known for a long time. We have developed the environment of historic sediment control facilities (2 Important Cultural Properties and 191 Registered Tangible Cultural Properties as of March 31, 2016) by positioning them and their surrounding environment as a core of tourism resources, thereby encouraging efforts that contribute to the formation of a new forum of human interaction.

(4) Community development leveraging histories and cultures

Historic landscape maintenance and improvement plans for 53 municipalities (as of March 31, 2016) have been accredited to drive community development leveraging local histories and traditional cultures and approaches pursuant to the plans supported, based on the Law on the Maintenance and Improvement of Historic Landscape in a Community (Historical Urban Development Law). In addition, we provided renovation and other support on buildings that serve as landscape and historic resources in order to drive forward the formation of pleasing scenic and historic landscapes.

Figure II-3-3-2

Civil-Engineering Art Sediment-Control Dam Tour (Otari-mura, Nagano prefecture)

Tourism and exchange activities are promoted using historic sediment control facilities that protect the communities.



Source) Otari Village Tourism Association

(5) Promotion of Mizubering Project

Mizubering is an initiative to provide opportunities to find a new value in rivers from outside to people and private companies leading daily lives or engaging in economic activities without being conscious of rivers around them.

Mizubering is an activity taking place in more than 40 locations nationwide aimed at realizing regional revitalization starting from waterfronts across Japan while creating a new social design by using rivers as a new frontier and various entities collaborating with each other.

The MLIT will support efforts of regional people and private companies through Mizubering so that value of rivers can be leveraged further to serve their roles as regional treasures.

Figure II-3-3-3

Riverbed Sketch (Miyagawa River, Takayama city, Gifu)



Source) Junior Chamber International Takayama

Figure II-3-3-4

Riverbed Created (Miyagawa River, Takayama city, Gifu)



Source) Junior Chamber International Takayama

Chapter 4 Promoting Regional Revitalization

Section 1 Approaches to Regional Revitalization

In order to properly respond to the declining birth rate/aging population to put a brake on population declines, while correcting the excessive concentration in Tokyo Area and maintaining vitality of Japanese society in the future by securing a comfortable living environment in each region, the Basic Policy for Overcoming Population Decline and Vitalizing Local Economy in Japan 2015 was formulated in 2015 and the Overcoming Population Decline and Vitalizing Local Economies: Comprehensive Strategy was revised, in accordance with the Act for Overcoming the Population Decline and Vitalizing Local Economy in Japan passed in November 2014. Also, with the aim of deepening the regional revitalization, the relocation of governmental organizations and the idea of the Japanese version of Continuing Care Retirement Communities were examined, and information, human and financial support for the development of the regional comprehensive strategy was provided.

In June 2015, the Regional Revitalization Act was revised to include measures to create compact villages small stations that maintain various life services to promote sustainable regions in hilly and mountainous areas, as well as support measures to relocate head office functions to rural areas aimed at ensuring stable and quality jobs in rural areas.

With respect to the National Strategic Special Zones, regulatory reforms in such areas as education, healthcare and employment were added to the amended Act on National Strategic Special Districts passed in July 2015, and in August of the same year, three districts (Senboku-shi, Sendai-shi, Aichi) were added as Regional Vitalization Special Zones, the secondary designation of the National Strategic Special Zones. In January 2016, the designation was further expanded to include three districts (Hiroshima and Imabari-shi, Chiba-shi, and Kitakyushu-shi) as the tertiary designation. By implementing specific projects in all districts designated and visibly realizing regulatory reforms in areas where changes were difficult to make due to strong oppositions, further efforts were promoted for regional revitalization.

The MLIT pushes forward the development of tourism regions, having the Japanese version of the Destination Marketing/Management Organization (DMO) as its core, creating various regional contents and establishing an environment to receive tourists to realize a high-quality tourism nation under the keywords of “region” and “consumption.” The MLIT also drives efforts to create jobs by promoting the securing and development of human resources engaged in the construction, shipbuilding, transportation and other industries that underpin regional economies.

Furthermore, with the aim of reviving regional communities, we are pushing forward efforts to make regional cities compact and create transportation networks, form small station and allied core metropolitan areas, and develop houses and towns for multi-generation residents in coordination with the comprehensive regional care system in suburban metropolitan areas. We are also promoting multi-habitation in earnest and establishing an environment for making relocation easier by facilitating distribution of existing homes in order to create new flows of people into rural areas.

The MLIT has also been driving nationwide urban renaissance, as through the development of public and public-benefit facilities in a public-private partnership, as well as urban renaissance aimed at enhancement urban international competitiveness leveraging private vitalities.

Section 2 Promoting Measures Supporting Regional Revitalization

1 Efforts Directed at Augment Regional and Private Self-reliance and Discretion

(1) Expanding and improving on administration on various subsidies

By providing the “Regional Renovation Infrastructures Reinforcement Subsidies” aimed at developing facilities of similar functions in a unified manner, and grants for regional rehabilitation strategies for driving effective efforts with regional ingenuity and devices to address issues faced by the regions, regional vitalization is promoted in view of reconstruction.

In addition, smooth and effective development of regional comprehensive strategies by local governments and implementation of good measures relating to this were supported through the advance-type grants for regional revitalization. Furthermore, we have started discussions on creating new types of grants to support autonomous and proactive efforts of local governments to deepen regional revitalization.

(2) Supporting local regional revitalization efforts

In addition to (1) above, the Regional Economy and Society Analyzing System (RESAS) was developed and enhanced and disseminated to the public as information support.

Also, human support is provided through, among other programs, the regional revitalization concierge that sets up a consultation desk at each ministry and the regional revitalization personnel support system in which government, private company, and other organizations’ personnel are sent to small-sized local governments. In December 2015, the Regional Revitalization Human Resources Plan was formulated, setting forth the policy of securing and developing specialized human resources who take roles in regional revitalization in joint efforts of the public and private sectors.

Regional activities relating to favorable social overhead capital are awarded with Handmade Hometown Prizes by ministers to promote further approaches to individualistic and charming regional planning across Japan. In FY 2015, marking the 30th anniversary of the program, the selection review was conducted by holding open presentations with the presence of organizations gathered from across Japan, and 22 award winners, including a regional development with cherry blossoms and Japanese dog’s tooth violet (carried out by the local project team of greening in Ya community) were selected (7 for grand prize division and 15 for general division). Furthermore, the information was sent by newsletter as good case examples that are useful for regional development ^{Note}.

(3) Promoting use of know-how and funds originating from private sectors

Excellent private urban redevelopment projects, such as those linked with an urban renaissance and development project undertaken by a local public entity and accredited by the Minister of MLIT are entitled to investment, joint implementation or any other form of support granted from general incorporated foundation Organization for Promoting Urban Development (hereinafter simply called MINTO). Support is also extended to a resident participation community development fund, which subsidizes community development projects carried out with local resident participation or the like.

The MLIT supports those projects relating to the diffusion and promotion of know-how, etc. that is possessed by private associations advanced in the practice of community development activities and that leads to continuing sources of certain profitability in the course of such activities so it can be horizontally extended to other

Figure II-4-2-1

Example of a private urban redevelopment project accredited by the Minister of MLIT
Katamachi Kirara



Source) MLIT

Note Regional Planning Information System-Repis website: <http://www.mlit.go.jp/sogoseisaku/region/chiiki-joho/index.html>
As of the end of FY 2015, there were 1,653 subscriptions to the online magazine (as of the end of March 2016).

associations about to embark on similar activities, or those experimental approaches, etc. relevant to ingenious, advanced private community development activities, in its bid to make the concept of sustainable community development with community participation come true through maintenance and betterment of community charms and vitalities and get it come to stay.

In addition, consideration is in progress toward the realization of measures aimed at combatting aging expressways in conjunction with urban redevelopment, using the Tsukiji River and other sections of the Metropolitan Expressways as model cases, on the basis of the Road Act amended in FY 2014 that allows for usage of upper open spaces on roads.

Moreover, public-private partnership efforts leveraging road spaces are pushed forward in order to create forums for regional activity/exchanges and maintain/improve road quality.

2 General Endeavors to Build an Intensive Urban Structure

Compact cities and development of surrounding transportation networks such as by rebuilding public transportation networks should be worked on continuously with the mid- to long-term perspectives as they are effective policy means to realize specific administrative purposes such as maintaining and improving convenience of lives of residents, revitalizing regional economies by enhanced productivity in the service industry, and reducing administrative costs by improved efficiency in administrative services.

With the aim of pushing forward initiatives of municipalities toward the realization of compact cities, the Act on Special Measures concerning Urban Regeneration was amended in 2014 to create the appropriate location plan system for encouraging establishment of residential and urban functions with economic incentives. As of the end of FY 2015, 276 municipalities made specific efforts on creating appropriate location plans, of which one city prepared and published the appropriate location plan.

In addition, the Compact City Formation Support Team was established (secretariat: MLIT) in March 2015 which provides support across ministries so that these initiatives of municipalities will be promoted as comprehensive efforts in coordination with various relevant measures concerning healthcare/welfare, housing, realignment of public facilities and the optimum use of government owned facilities.

The Team responds to consultation from municipalities and collects their issues/needs by holding briefing sessions for municipalities, block consultation meetings and the like as one-stop services, and shares the issues and other information collected with relevant ministries to examine support measures in light of coordination with other relevant measures. Also, in order to yield multifaceted effects of compact cities, relevant ministries will support initiatives of municipalities in a unified manner by such means as putting together model cases of good initiatives that would serve as useful reference for other municipalities and sharing information on specific effects and details of initiatives in a visible manner.

3 Urban Planning and Infrastructures Development Taking Advantage of Regional Characteristics

(1) Emergency development of urban planning roads instrumental in encouraging private investment

The development of urban planning roads is significantly instrumental in facilitating urban reconstruction because it encourages the reconstruction, etc. of roadside buildings. For those routes under construction whose completion is bottlenecked because of only a small lot of land yet to be purchased, the local governments (project implementing entities) announce their pledges to complete the construction within a certain period of time (completion time declaration routes; as of April 2015, 139 routes were declared by 71 project implementing entities) to speed up the development of the project benefits.

(2) Developing transport nodes

Transport nodes, such as railway stations and bus terminals, hold a high degree of convenience and potential as the core of urban reconstruction, because they attract numerous people to use the various kinds of transport facilities that converge upon them.

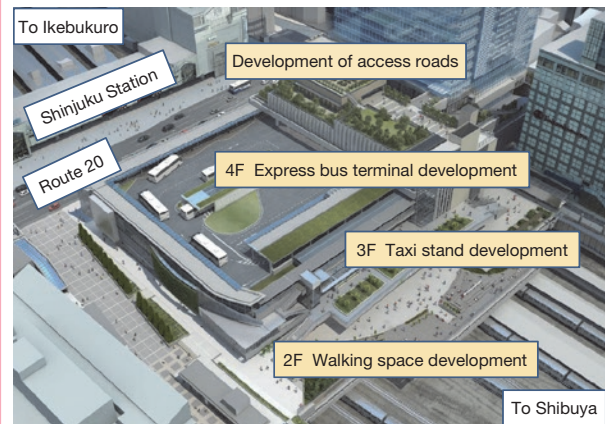
The MLIT leveraged the implementation of transport node improvement projects, urban and regional transport strategy promotion projects, integrated railway station improvement projects, and other projects at the transport nodes, such as the

Shinjuku St. South Exit District, and in the surrounding areas to improve the ease with which passengers transition from one means of transportation to another, to consolidate the urban areas disrupted by railways, to improve station functions, and to streamline urban traffic and augment the functions of these transport nodes.

The MLIT also encouraged upgrading the station facilities for the general goal of safe and comfortable regional living by building child-support and medical facilities at the premises of existing railway stations. This idea came from the viewpoint of regional concentration, which brings medicine, work, and living into closer vicinities.

Figure II-4-2-2

Example of a transport node improvement project
(Shinjuku Station South Exit)



Column

Shinjuku Expressway Bus Terminal – various improvements in the infrastructure to enhance the convenience of Shinjuku Station south exit –

Koshu Highway (Route 20) facing the south exit of Shinjuku Station is one of the five main highways developed by Ieyasu Tokugawa in the Edo period and was bustling with people as the first post town, Naito Shinjuku, on the Koshu Highway that started from Nihonbashi Bridge.

Shinjuku remains bustling in the current Heisei era. The surroundings of the south exit of Shinjuku Station have the most passengers in Japan and are chronically congested with numerous cars and pedestrians coming and going. Improvement of the area around the south exit has been an urgent issue to ease the congestion and raise the level of convenience.

○ Replacement of Shinjuku Overpass of Koshu Highway

Shinjuku Overpass, which is supporting Koshu Highway stretching over railroads, was constructed in 1925.

Replacement had been discussed for a long time from the viewpoints of deterioration and resistance to earthquakes. As the result, the replacement project started in fiscal 1994 and was completed nearly 20 years later in fiscal 2012 by which the 80-year-old deteriorated overpass was renewed to a strengthened structure.

Comparison of the aged bridge with that after maintenance



Old bridge built in 1925

Steel truss structure



Replaced bridge in 2012

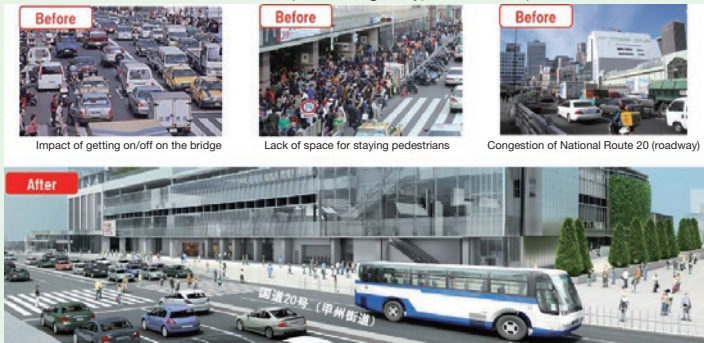
Steel framed concrete structure

Source) MLIT

o Development of transport nodes

In the surroundings of the south exit of Shinjuku Station, where about 60,000 cars and 140,000 pedestrians pass by per day, there was a shortage of comfortable spaces and issues of traffic congestion and accidents associated with passengers of taxis and private vehicles. In addition, even though the area functions as important transport nodes that represent the Tokyo metropolitan area, bus stops of highway route buses were interspersed in the Shinjuku area, so transfers among transport services, such as railways, highway route buses, and taxis, were not convenient. To solve this situation, safe, secure, and comfortable spaces for pedestrians have been created and the function as transport nodes enhanced by effectively utilizing the artificial grounds that were used as the operation yard for the replacement project of Shinjuku Overpass and by improving the function as transport nodes.

National Route 20 (Koshu Highway) after development



Source) MLIT

Consolidated major highway bus stops around Shinjuku Station



Overview of Facilities at Shinjuku South Exit Traffic Terminal

<<Facility Overview>>

- Location: Shinjuku 4-chome, Shinjuku-city to Yoyogi 2-chome, Shibuya-city
- Facility area: approx. 1.47 ha
- Structure: Eight stories aboveground, two stories underground
Steel construction, partially steel-framed reinforced concrete structure
- Use: 4F Express route bus related facilities
3F Taxi stand, etc.
2F Station facilities, pedestrian plaza

4F Express route bus related facilities
(Image)

3F Taxi stand, etc.
(Image)

2F Station facilities, pedestrian plaza
(Image)

Source) MLIT

In October 2015, the public was invited to create a nickname for the Shinjuku South Exit Transportation Terminal, and in January 2016, it was decided to be “Shinjuku Expressway Bus Terminal.” The terminal opened on April 4 in the same year. Since then, it has been expected to bring stock effects from this improvement project, such as decreases in traffic congestion and accidents, higher convenience brought about by the integrated bus terminal, and the liveliness of the attached commercial facilities, and to lead to more efficient operation control with use of IT.

(3) Wide-area development of infrastructures to induce firm location

Competition, collaboration, and regional buoyancy in East Asia should benefit greatly by inviting and accumulating internationally competitive growing industries in the individual regions. Motivated by this recognition, measures have been promoted to support expanding regional employment and more buoyant economy by concentrating investment on the development of those infrastructures that are truly needed to carry out unique regional approaches, such as developing airports, ports and harbors, railroads and wide-area expressway networks.

(i) Airport development

Aviation network connecting distant cities at home and abroad are greatly instrumental in revitalizing regional communities, boosting the tourism industry and corporate economic activities. It is expected that the aviation sector will play a key role to boost Japanese economy taking advantage of global economic growth, in particular booming economy in Asia. In an effort to enhance Japan's international competitiveness and regional competitiveness in the hinterlands of the airports, MLIT has been making efforts to enhance airport capacities and relocate or change the internal layout of airport terminal area in order to improve user-friendliness.

(ii) Port and harbor development

In Japan, which is surrounded by the sea, the majority of international trades are conducted by marine transportation, and domestic marine transportation serves important roles in logistics and interactions between regions. Ports and harbors are the gateway for international trades and support Japanese industries as places of corporate activities. In order to enhance international competitiveness of Japanese industries by improving logistics efficiency and to maintain and create employment and income, international logistics terminals are being developed at ports and harbors that underpin regional key industries.

Column

Registration of Miike Port, constructed in 1908 and still in operation, as a World Heritage Site

On July 5, 2015, the “Sites of Japan's Meiji Industrial Revolution: Iron and Steel, Shipbuilding and Coal Mining” were inscribed on the World Heritage List. The Sites of Japan's Meiji Industrial Revolution consist of industrial heritages testifying that from the late 19th century to the early 20th century, Japan had laid the foundation for an industrial nation and had been rapidly industrialized in heavy industries, such as iron and steel, shipbuilding, and coal mining, which later became key industries in Japan, and that the transfer from the West to the non-West had been successfully achieved. One of the component parts is Miike Port (in Omuta-shi, Fukuoka), which was constructed in 1908, and is still in operation as a port supporting the regional economy.

Miike Port on the Omuta Coast was developed to accommodate large ships for more efficient transportation of Miike charcoal, which was produced in Miike coal mines facing the Ariake Sea. In the port, port facilities were systematically placed, including a large sediment control groin with a hummingbird shape to overcome the influence of sand and mud brought by the shallow Ariake Sea, a dock with a lock to cope with the different tide levels.

Takuma Dan, a leader of the port construction, had visited coal shipping ports around the world ahead of the construction. He brought together the most advanced civil engineering and the wisdom of ports in the Meiji era in Japan and put them into the development of harsh natural environment of the Ariake Sea in order to have Miike Port developed by Japanese engineers.

As for the port construction, Takuma Dan said as follows: “Coal mines will not last forever. If they are lost, this town will go back to a field. If a port is constructed, industries will be promoted here. If there is a port, it

will serve as the foundation of the town for 100 years or so.”

Exactly as these words say, Miike Port is still being operated as a port supporting regional economic and industrial activities. This is a case that demonstrates that the port development brings about long-term effects on the regional economy, such as establishment of enterprises and increases in employment.

Full View of Miike Port



Source) MLIT

(iii) Railway development

The nationwide network of trunk railways is the lifeblood of passenger and freight transport, accelerating interaction between blocks and between regions, encouraging industrial location, and activating regional economies to energize regional living. Rail freight transport, in particular, plays a dominant role in moving industrial commodities that support regional economies.

(iv) Road development

Most newly built plants are located within 10 km from an expressway interchange in order to promote the efficient logistic flow of products and materials, transportation convenience, and so on. The formation of a new network of trunk highways, such as arterial high-standard highways, is being promoted to strengthen international competitiveness and to further regional independence and industrial growth through accelerating and facilitating logistics.

(4) Accelerating the development of transport infrastructures

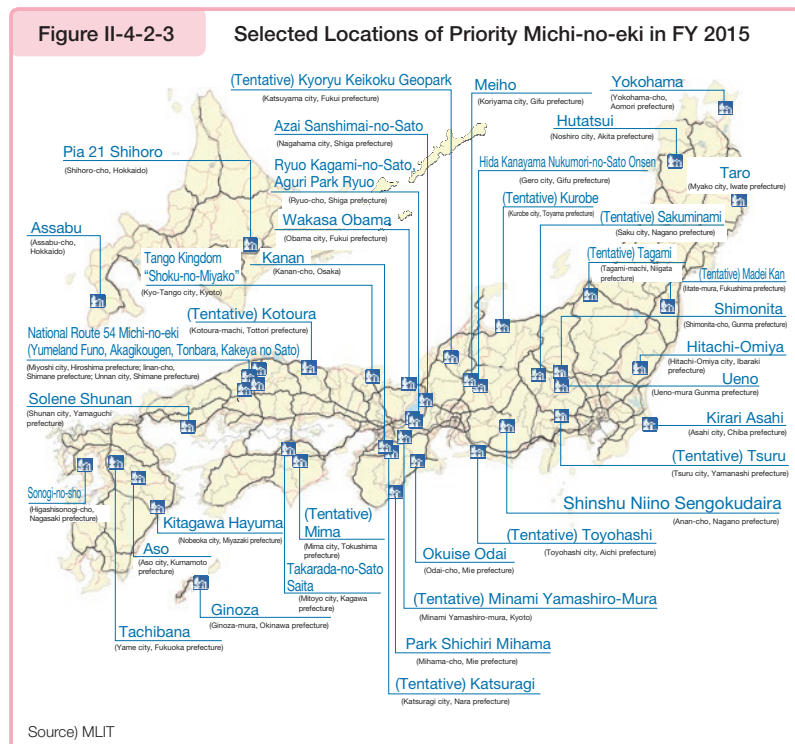
Regarding the method of determining whether considerations for setting sectional surface rights, etc. relating to projects authorized to use deep underground pursuant to the Act on Special Measures concerning Public Use of Deep Underground (Deep Underground Act) are to be treated as transferred income or not, the FY 2015 tax reform took a measure to have the considerations set according to the vertical range of the sectional surface rights, etc. in which the profit from use is limited, instead of one fourth of the land price. This measure taxes, as transfer income, a certain amount of the considerations for setting sectional surface rights, etc., relevant to the projects that are implemented as integral part of a project accredited under the Deep Underground Act, granting a special credit of 50 million yen for exchanges on expropriation, etc..

(5) Promoting community-conscious projects and programs

(i) Michi-no-eki (Roadside Station)

Located roadside, a Michi-no-eki is a facility that combines a mix of roadside amenities, including parking spaces and restrooms, sources of information, including highway and regional information, and a forum of regional partnerships, which encourages interaction between a region and users of the roads in that region and between regions. As of March 2016, 1,079 Michi-no-ekis are registered.

Efforts have progressed in recent years to set up Michi-no-ekis as hubs of regional revitalization nationwide by attracting many visitors through featuring local specialties and tourist resources, thereby creating regional employment, reactivating economies, and helping improve resident services. As a framework to provide focused support to these efforts in coordination with relevant organizations, the priority Michi-no-eki system was created in FY 2014. In addition to six national model michi-no-ekis and 35 priority michi-no-ekis selected then, 38 priority michi-no-ekis were newly selected in FY 2015.



(ii) Support system for river-town development

In order to revitalize rivers that show various shapes from the mouth to the source and communities connected to them, we are promoting the formation of favorable spaces where rivers and towns integrate by formulating and registering plans for river-town development that utilizes rivers with practical use of resources; such as landscape, history, culture and foundation for tourism; and inventive wisdom of the district, under coordination among municipalities, private businesses, local residents, and river administrators.

(iii) Managing rivers with resident participation to suit regional characteristics

Those individuals who possess an expert knowledge of river environments and who are zealous for the idea of good river development are appointed river environment preservation monitors to help create and preserve river environments and carry out meticulous activities aimed at ensuring and promoting orderly river usage. Love river monitors are also at work, collecting information about river management, such as locating cases of illegal garbage dumping into rivers and detecting flaws in the river facilities, and promoting the philosophy of river preservation.

Further, with the inauguration of a river cooperation organization designation program, the MLIT designates those private organizations, etc. that pursue activities voluntary relevant to the development, maintenance, etc. of river environments as river cooperation organizations and legally accredits them as an organization working in conjunction with a river administrator, with a view to promoting their organized voluntary activities and driving diverse modes of river management tailored to specific regional conditions.

(iv) Supporting efforts to take advantage of the regional features of the seaside

With the aim of stimulating the use of the seaside and enhancing its charms as tourist resources, we support seaside environment development projects in which active seaside usage plans are formulated and seaside preservation facilities are developed according to the plans.

Since a seaside cooperation organization designation program was inaugurated, the MLIT will designate those

corporations and associations that are accredited to be capable of voluntarily conducting various activities, such as cleaning and planting seashores for preservation, protecting rare species of animals and plants along the seaside, getting prepared for natural disasters and hosting sessions of environmental education, and implementing proper and positive coastal management, as seaside cooperation organizations to reinforce the ties of collaboration with localities and thus to enhance coastal management to suit regional characteristics.

(v) Regional promotion built around ports

Those facilities at which continual approaches to regional development are carried on have been accredited and registered as Minato (Port) Oases by Regional Development Bureau Director Generals and others to promote community development around the core of ports to help revitalize localities by promoting exchanges of local residents and tourism (as of March 31, 2016, 88 ports).

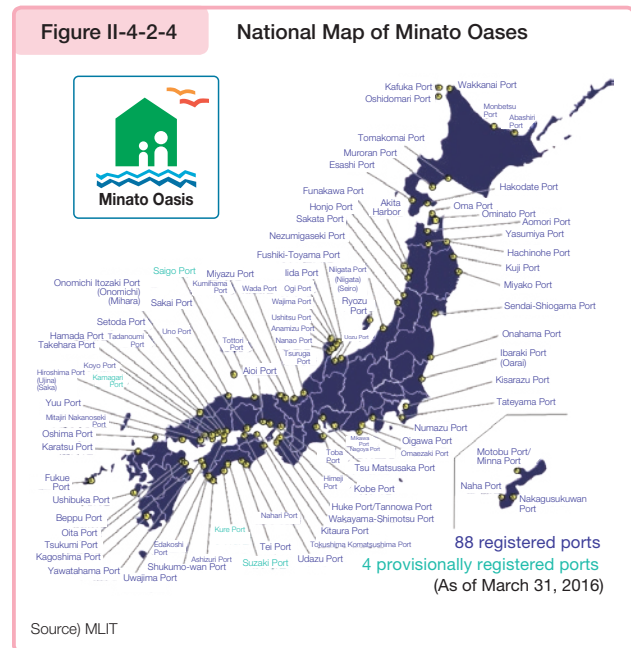
Diverse events with resident participation taking advantage of regional characteristics and ingenuities are being held at the Minato Oases nationwide, bustling with numerous local residents and tourists.

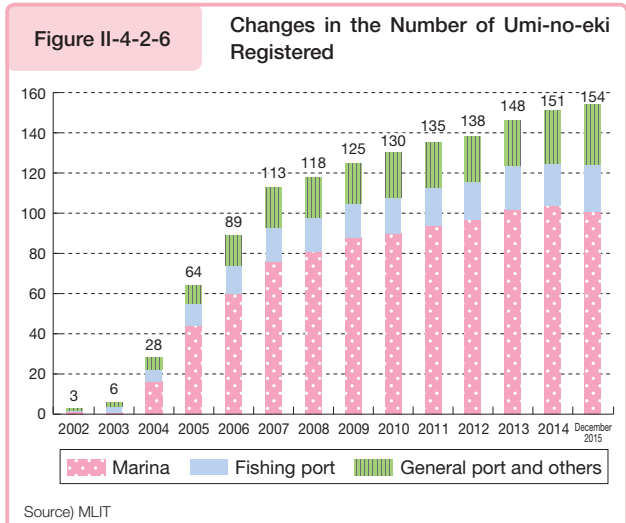
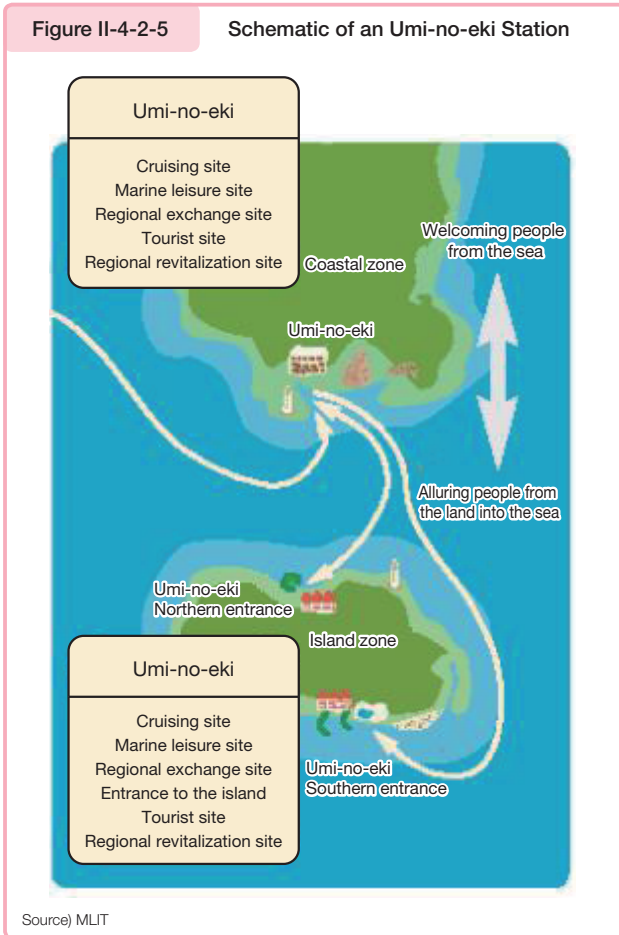
In addition, the All Japan Sea-kyu Gourmets Competition, an event featuring local specialty food, held at the National Council on Minato Oases, an organ aimed at encouraging exchanges, etc. among the administrators of the Minato Oases nationwide, attracted a large number of participants.

With the aim of regional revitalization, further utilization as venues for providing services to increasing passengers of oceangoing cruise ships and the like is expected.

(vi) Building centers of marine leisure

The MLIT not only drives the construction of Umi-no-Eki Stations as marine leisure sites that leverage existing port facilities, marinas, fish arenas (fishing + arena) and the like (as of the end of December 2015, 154 Umi-no-eki available) but also provides support, etc. to diverse, regionally distinctive efforts in progress at Umi-no-eki, such as cruising by rental boats, sale of marine products, a hands-on experience with fishing and sponsoring of events.





(6) Promoting the maintenance of cadastral maps positively

Cadastral surveys are conducted by municipal authorities to determine the boundaries of individual lots of land, which contribute to smoother land transactions, private development and infrastructure development, as well as faster disaster prevention and restoration/reconstruction from disasters. The MLIT not only provides financial support to cadastral surveys, develops public-private boundary information in urban areas and preserves boundary information in mountain villages under direct state control to accelerate cadastral surveys, but also promotes the utilization of non-cadastral survey results.

The MLIT also supports the implementation of cadastral surveys in the regions devastated by the Great East Japan Earthquake in conjunction with restoration and reconstruction projects and refurbishes government-private boundary information under the government's direct control in the areas that could be inundated by Nankai Trough Earthquakes once they occur and drives the maintenance of land registers in the areas that could be hit by massive natural disasters, thereby contributing to safe and secure regional developments.

(7) Deep underground utilization

Regarding deep underground utilization, deep underground utilization council is leveraged to exchange information on deep underground space in addition to technical discussions on smoother examination.

4 Self-Reliance and Revitalization of Wide-Area Blocks, and Formation of National Land

(1) National land and regional development for creation of convection promoting national land

To achieve regional revitalization and sustainable growth, it is important to deploy measures in an integrated manner while drawing out regional wisdom and devices. Therefore, with the aim of forming convection promoting land that

encourages innovations by dynamically inducing convection across Japan under the National Spatial Strategies and Regional Plans, measures are being taken according to the characteristics of regions while working to form multi-layered national land and regional structures. The MLIT also works on strategies for regional revitalization through public-private partnerships and government support in developing foundations that underpin private sector activity and measures to drive forward autonomous and sustainable regional development with cooperation among various entities.

(i) Promotion of infrastructure development for wide-area regions and revitalization

To implement structural and non-structural mixes of efforts designed to form self-reliant wide-area blocks and to revitalize the regions through buoyant human or material traffic, the MLIT has granted subsidies to 145 plans on the basis of wide-area regional revitalization infrastructures development plans prepared by prefectures. Of these plans, 70 have been worked out by multiple prefectures working in accord and cooperation in a bid to revitalize even wide areas.

(ii) Promoting the development of infrastructures for regional revitalization with partnership between the public and private sectors

In order to support smooth and speedy transition from the planning stage to the implementation stage, at the time of private sector decision-making without missing opportunities for infrastructure development projects that have been worked out in a partnership between the public and private sectors to contribute to wide-area regional strategies, a system was created in FY 2011. In FY 2015, 18 surveys were supported, including reviews of specific project methods such as the possibility of introducing PFI.

(iii) Promoting regional planning with diverse entities interworking

In its bid to further self-supporting, sustainable community development through the interworking of local diverse entities, the MLIT supports efforts to: (a) gain absolute assessments of the social values of community development activities, and (b) build a support system with various entities interworking with one another to craft project-type community development activities (regional businesses).

(iv) Formation of vibrant economic and living zones through allied core metropolitan areas

In metropolitan areas that have a certain size of population and economy, the formation of allied core metropolitan areas that aim to lead economic growth, consolidate and strengthen high-level city functions and enhance services related to people's daily lives is promoted.

Originally metropolitan areas in scope (61 areas) were mainly regional ordinance-designated cities and core cities (population of 200,000 or more), in FY 2015, the Overcoming Population Decline and Vitalizing Local Economies: Comprehensive Strategy (revised in 2015, adopted by a Cabinet decision on December 24, 2015) added metropolitan areas centering on adjacent two neighboring cities with population of more than 100,000 each to the scope under certain conditions.

(2) Promotion, etc. of regional center formation

(i) Developing centers of self-reliant growth of diverse wide-area blocks

In accordance with the Multi-Polar Patterns National Land Formation Promotion Act, the development of core cities ^{Note} is pushed forward by relocating business facilities and concentrating various other functions in the core cities, helping ease excessive concentration in downtown Tokyo to some extent. The development of core cities will continue further. In addition, the MLIT has driven the construction of Tsukuba Academic City to pursue urban revitalization by taking advantage of an accumulation of science and technology in accordance with the Act on Construction of Tsukuba Science City. Furthermore, environmentally friendly cities are being built along the Tsukuba Express railroad line by leveraging the characteristics of Tsukuba Science City as the pace of urban development accelerates. In the Kinki Metropolitan area, on the other hand, the construction of Kansai Science City is underway to form a new foothold for the deployment of cultural, academic and research activity in accordance with the Kansai Science City Construction Promotion Act. Further efforts to promote the science city continue in a partnership among the ministries concerned, local governments, economic

Note A core city is a city located outside the wards of Tokyo that should serve as the core of a reasonably wide area surrounds its location (There are 14 core cities.).

circles and so on pursuant to the Basic Policy for the Construction of Kansai Science City. In addition, the MLIT promotes the implementation of a development plan based on the Act on Development of Osaka Bay Areas to make a district that is complete with the facilities of a global city, good living amenities and more.

(ii) Promoting Small Stations development within a village area

There are hilly and mountainous areas and other regions with declining and aging population where it is increasingly difficult to maintain life service functions, including shopping and healthcare, and community functions. Therefore, in regions that have multiple villages including elementary school districts, we are promoting the formation of small station where needed functions and bases of regional activities are gathered in walking distances and transportation networks with near villages are secured.

Specifically, we examine the overall regional framework for developing small station, support the realignment and consolidation of facilities leveraging existing public facilities, and work on penetration and boosting awareness in coordination with relevant ministries.

(iii) Reviews of the relocation of the Diet and other organizations

The MLIT aids the Diet in its reviews of the relocation of the Diet and other organizations based on the Act for Relocation of the Diet and Other Organizations by conducting surveys on the relocation of the Diet, disseminating information to the nation and so on.

(iv) Examination of measures on land for which whereabouts of owners is difficult to find

From April 2015, this issue was examined at the *review meeting for measures on land for which whereabouts of owners are difficult to find*, and the guidelines for assisting the search of owners, approaches to the use of land and other field measures as well as the final summary of the meeting were published in March 2016.

5 Promoting Regional Partnerships and Interaction

(1) Forming a trunk-line network to support regions

To achieve safe, comfortable travel to the central part of an area that has urban functions, such as medical care and education, the MLIT supports the elimination of bottlenecks by widening existing roads and developing road networks. Furthermore, in order to promote the integration of merged municipality, the development of roads that connect the central area of a municipality to each of its centers, such as public facilities, bridges, and so on, is being promoted by implementing municipal merger support road development projects in collaboration with the Ministry of Internal Affairs and Communications.

(2) Promoting human interaction between cities and farming, mountain and fishing villages

The MLIT forms axes of human wide-area interaction and partnership through the development of trunk road networks, supplies housing and housing lands to help realize a country life, develops ports and harbors to serve as centers of human interaction and more. It also promotes the creation of new breeds of tourism, such as green tourism, and the activities of “All Right! Nippon Conference” and so on in collaboration with the Ministry of Agriculture, Forestry and Fisheries and other ministries concerned to promote human interaction between cities and farming, mountain and fishing villages.

(3) Promoting regional settlement, etc.

In order to support information dissemination by municipalities that work on expanded interactions and relocation to rural areas through hands-on exchange programs for young people in rural areas, such information is put together in the MLIT website. Information about dual habitation is also being disseminated ^{Note}.

The MLIT also supports the appropriation of General Social Infrastructures Development Subsidies for the utilization of vacant houses and buildings and disseminates information about the measures taken by local governments in connection with house replacement and dual-area residence, information about nationwide banks of vacant houses and to address the issues of a wide range of regional issues.

(4) Introduction of local design license plate

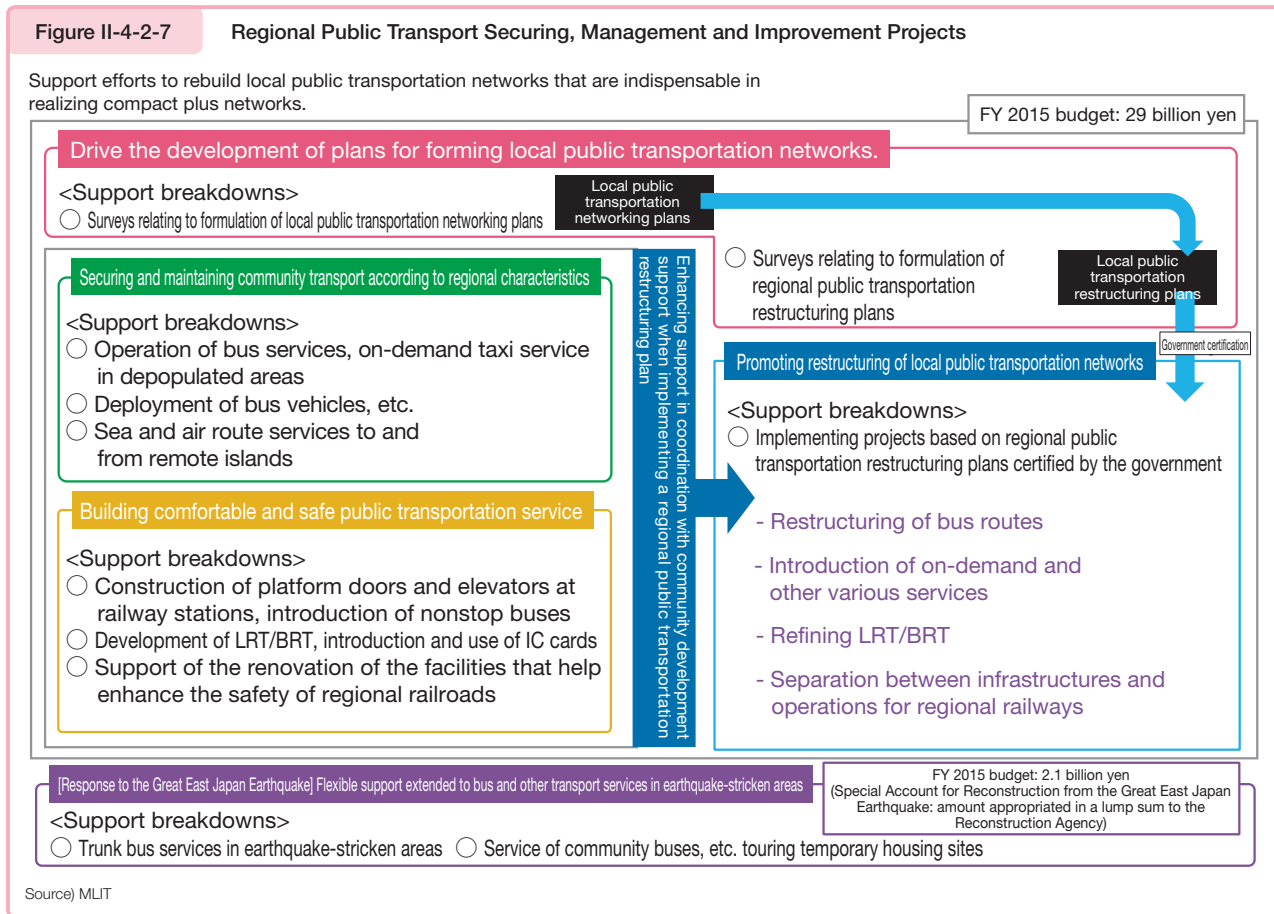
Upon passing of the Act to Partially Amend the Road Transport Vehicle Act and the Act on National Agency of Vehicle Inspection that incorporates the exchange system for design license plate according to the wishes of car users, we started examinations in August 2015 for issuance of license plates with designs that feature regional characteristics.

6 Securing Means of Regional Transport

(1) Securing, maintaining and improving means of regional transport

Maintaining day-to-day means of regional transport is of vital importance to the revitalization of regional communities. Out of this recognition, the MLIT supports efforts directed at forming comfortable and safe public transport, as by securing and maintaining community transport, such as regional bus routes and sea and air routes to remote islands, in collaboration with diverse stakeholders and developing facilities that help add to the safety of local railways. In FY 2015, we facilitated the realization of efficient and sustainable local public transportation by enhancing support in the realignment of local public transportation, leveraging the framework of the Act on Revitalization and Rehabilitation of Local Public Transportation Systems.

Note MLIT regional Revitalization website: http://www.mlit.go.jp/kokudoseisaku/chisei/kokudoseisaku_chisei_mn_000016.html



(2) Activating regional railroads and supporting safety assurance, etc.

While regional railroads not only support the livelihood of the local residents living along the railroads as a means of their daily transport but also play an important role in providing them with public transport of critical importance in supporting regional interaction between tourist resorts. However, their management is in an extremely tough situation. For this reason, the MLIT supports not only the maintenance of safety facilities by implementing regional public transport securing, management and improvement projects or offering tax incentives but also the construction, etc. of new stations on those local routes that have high potential needs for railway use by implementing projects designed to activate trunk railways, etc..

(3) Subsidizing regional bus routes

Securing and maintaining means of regional public transport, such as public buses, for the benefit of local residents, particularly those with limited access to transport, such as elderly people and schoolchildren, is of critical importance. To help secure and maintain optimal networks of regional transport tailored to specific regional characteristics and conditions, the government has a policy of providing integrated support to the availability of regional transport services (such as inter-regional bus transport networks ^{Note} or bus, demand-responsive and other forms of regional transport closely related to trunk transport networks) under a scheme of shared responsibility with local governments. For other routes, relevant financial measures are taken to enable local governments to maintain them at their own discretion.

Note Broad-area trunk bus routes whose maintenance has been justified at a conference and that meets government-established criteria (spanning multiple municipalities, with at least three runs of service a day).

(4) Supporting transport to and from remote islands

To sustain air transportation to remote islands, air carriers extending their air routes to remote islands are granted comprehensive support (budget: airframe purchase grants, operational cost grants, tax and public dues: landing fee alleviation, aviation fuel tax alleviation and so on). Starting from FY 2012, airfare discounts for isolated islanders have been subsidized on the air routes eligible for operational cost grants as part of expanding support to transport to and from remote islands.

Remote island sea routes, a vital means of transport to support islanders' daily living, are now extremely tough to economically manage. The running costs of those sea routes for daily life that are anticipated in the red and for which no alternative routes are available are subsidized by regional public transport securing, management and improvement projects. Also, fare discounts subsidies for island residents and support in building ships with better operational efficiency are provided.

Furthermore, based on the Basic Plan on Transport Policy (February 2015), the operation of bus transportation with land and sea connection that enables the elderly and those who have walking problems to use a ferry while riding on a bus started from April 2015, and 10 business operators are providing the service as of the end of FY 2015.

In FY 2015, 54 remote island air routes were in service, when compared with 289 sea routes available at the end of FY 2014 (119 of which are grant-maintained air routes).

Section 3 Promoting the Private Urban Development

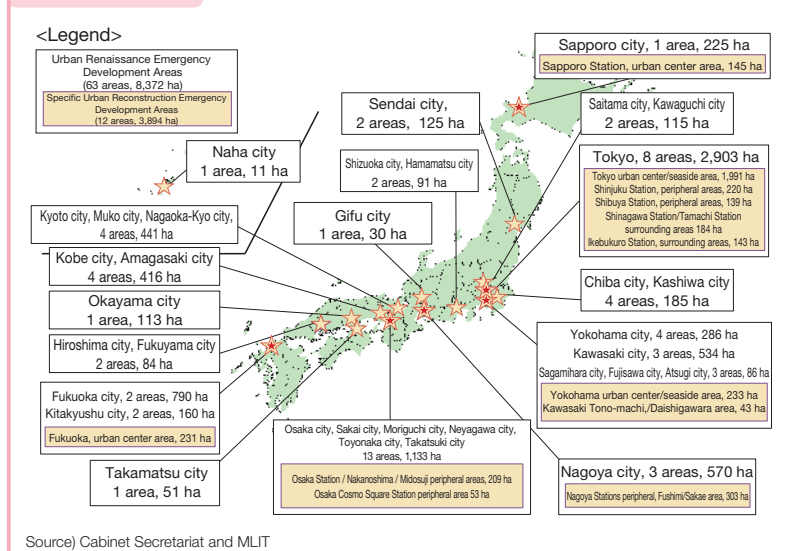
1 Promoting Urban Development by Private Sectors

(1) Promoting urban development by private sectors based on the Specific Urban Reconstruction Emergency Development Area program

While rapidly growing Asian nations have resulted in a proportionate decline in Japan's international competitiveness, it has become an essential task to provide a powerful boost to the development of the urban areas in the nation's major cities, a source of impetus to the national growth, in a partnership between the public and private sectors to turn them into attractive urban centers that lure businesses, human resources and more from overseas. To this end, the MLIT established the system of Specific Urban Reconstruction Emergency Development Areas to enhance urban international competitiveness of the designated areas, and 12 areas nationwide are now designated as such (as of March 2016). In nine of them (as of the end of March 2016), development plans were formulated by councils formed in a partnership between the public and private sector. The International Competition Base City Development Project has also been launched to provide prioritized, concentrated support to the development of urban center infrastructures in accordance with development plans.

Figure II-4-3-1

Status of Designation of Special Urban Renaissance Emergency Development Areas and Urban Renaissance Emergency Development Areas (As of the end of March 2016)



In FY 2014, financial support (mezzanine support services^{Note}) that is extended by MINTO (Organization for Promoting Urban Development) to private projects that develop functionalities for augmenting the international centripetal force of foreign language-ready medical care facilities and the like was enhanced to support the formation of global business and living environments. At the same time, Project Supporting the Improvement of International Business Environments, etc. and City Sales was inaugurated to provide comprehensive support, in terms of both non-structural and structural measures, to the betterment to urban facilities that make for better international business environments, etc. and to city sales.

As of the end of March 2016, a total of 63 Urban Reconstruction Emergency Development Areas were registered in government-ordinance-designated cities and prefectural capitals, including Tokyo and Osaka, hosting a variety of urban development projects by private sectors in steady progress. Mezzanine support services supporting the procurement of middle-risk funds are carried out by MINTO.

The bill to amend the Act on Special Measures Concerning Urban Renaissance etc. submitted to the Diet in February 2016 includes such measures as extending the application deadline for minister approval of private urban reconstruction projects, providing financial support on international conference and other venues that contribute to enhanced international competitiveness, establishing a system for the arrangement of continued supply of energy to buildings and hospitals within the areas not only during peace times but also times of disasters, and expanding the deregulation measure of allowing construction of buildings above roads or underground to cover all Urban Reconstruction Emergency Development Areas.

(2) Status of application of the measures to support urban reconstruction projects

(i) Zoning for Special Urban Reconstruction Districts

A Special Urban Reconstruction District is a new concept of urban district, with greater latitude of zoning, which is exempt from existing zoning restrictions. A total of 79 Special Urban Reconstruction Districts were zoned as of the end of March 2016, 56 of which had been proposed by private entrepreneurs, etc..

(ii) Accreditation of private urban reconstruction project plan

Private urban reconstruction project plans accredited by the Minister of Land, Infrastructure, Transport and Tourism (91 plans as of the end of March 2016) are financially supported by the Organization for Promoting Urban Development or granted tax incentives.

(3) Promoting the formation of larger blocks

Since many of the central areas of Japan's major cities have been organized into blocks through the implementation of postwar reconstruction land adjustment projects, etc., the scales of these blocks, with the structure of the local streets, are not fully responsive to the prevailing needs, etc. for land usage, transport infrastructures, and disaster preparedness. To reinforce the international competitiveness of the big cities, revitalize local cities, and seek advanced and effective land usage to fill present-day needs, the MLIT promotes the aggregation of land that has been segmented into multiple blocks, the consolidated usage of sites and restructuring of public facilities.

2 Approaching National Strategic Special Districts

In addition to the special exemptions from the Building Standards Act, the Road Act, the City Planning Act and the like introduced as regulatory reforms in the Act on National Strategic Special Zones passed in December 2013, the amendment to the Act on National Strategic Special Zones passed in July 2015 included special exemptions concerning establishment of nursery schools in city parks. Utilizing these special exemptions, specific projects are being implemented in Tokyo Area, Kansai Area, Fukuoka city, and Okinawa, visibly driving forward reforms of regulations that had been difficult to change due to stiff oppositions.

Note A mezzanine support service is defined as among all services that involve the development of public facilities with environmentally friendly architectural structures and sites, those that are accredited by the Minister of Land, Infrastructure, Transport and Tourism and that are entitled to the procurement of a middle-risk fund (such as a loan granted with an option to leave principal and interest subordinated) by MINTO are defined as "mezzanine support services."

Section 4 Promoting Localized Promotion Measures

1 Measures Directed at Heavy Snowfall Areas

The MLIT not only promotes the availability of transport and the development of the living environment and national land management facilities under the Act on Special Measures concerning Countermeasures for Heavy Snowfall Areas but also conducts surveys for safe, comfortable community planning. As of April 2015, 532 municipalities were specified as heavy-snowfall areas (201 of which were designated as special heavy-snowfall areas).

2 Promoting Remote Islands Development

The MLIT is supporting remote islands development pursuant to the remote islands development plans formulated by the prefectures in accordance with the Remote Islands Development Act not only by appropriating lump-sum budgets for the implementation of public works projects, but also extending Remote Islands Rejuvenation Grants, to encourage settlement in remote islands, as by fostering industries and increasing employment, accelerating the scope of exchanges, as by promoting tourism, improve and consolidate safe and secure settlement conditions and so on.

3 Promoting and Developing the Amami Islands and Ogasawara Islands

In addition to implementing the development of social infrastructures through promotion and development projects, etc. based on the Act on Special Measures for Promotion and Development of the Amami Islands and Act on Special Measures for Promotion and Development of the Ogasawara Islands, the MLIT leverages grants, etc. to assist with regional efforts directed at boosting employment and encouraging settlement by promoting tourism, agricultural and other industries suited to regional characteristics in pursuit of more self-supporting, more sustainable growth.

4 Promoting Peninsulas

Based on the Peninsular Areas Development Act as extended and amended in April 2015, prefectures prepared revised peninsular development plans, which received consent of the competent minister in February 2016 upon deliberation at the National Land Development Council. Furthermore, in addition support provided in establishing circulation roads in peninsulas and promoting industries, a project for promoting peninsulas with wide-area cooperation is newly established to assist facilitation of exchanges leveraging resources and characteristics in peninsulas, promotion of industries, and non-structural projects that contribute to settlement.

Section 5 Promoting Comprehensive Development of Hokkaido

1 Promoting the Hokkaido Comprehensive Development Plan

(1) Formulation of the New Hokkaido Comprehensive Development Plan

Japan has pursued an active policy of developing Hokkaido to help resolve the problems facing the nation and to achieve powerful regional growth by taking advantage of the excellent resources and characteristics of Hokkaido. In response to various changes in circumstances surrounding Hokkaido development, a new plan was developed with deliberations held at the National Land Development Council's Hokkaido Development Subcommittee (including the planning taskforce) from January 2015, and the new plan was adopted by a Cabinet decision in March 2016.

The new plan, which covers a period from FY 2016 to roughly FY 2025, promotes various measures with the goals of forming the world's Hokkaido that has local communities where people sparkle, industries that look to the world, and strong and sustainable national land.

Figure II-4-5-1 Overview of New Hokkaido Comprehensive Development Plan

Chapter 1 Significance of Plan Developed

Section 1 Background of Hokkaido Development

- Hokkaido development was promoted under special development policy to contribute to the safety and development of Japan as a whole.
- Growth industries were budding with exports including foods doubling and the number of foreign tourists topping 1 million. On the other hand, the economy and population are shrinking. Concerns exist in relation to areas where networks have yet to be developed and maintenance of regional communities.

Section 2 Trends of the Time Surrounding Japan

- (1) Coming of the era of drastic population declines
- (2) Further globalization and changes in international environments
- (3) Imminent large-scale disasters

Section 3 Significance of New Hokkaido Comprehensive Development Plan

- **Fundamental significance of Hokkaido development:** contributing to the resolution of Japan's tasks to be addressed by leveraging resources and characteristics of Hokkaido.
- There is the risk that it becomes difficult for Hokkaido to maintain its **production space**, which contributes to Japan by providing strength of Hokkaido, such as foods and national environments, due to a rapidly declining and aging population.
- The next ten-year period is critical with the **survival of production space and region** at stake.
- Also, the period could provide **opportunities for the region to leap forward** with the opening of Hokkaido Shinkansen, the extension of expressway network to eastern Hokkaido, and 2020 Tokyo Olympic and Paralympic Games.
- By utilizing these opportunities, create a leading example of local communities where people can have good life without losing vitality regardless of drastic population declines.

Chapter 2 Plan Goals

- Catch-phrase: **The World's Hokkaido**
- Vision: Creating **the world standard value creation space** with 2050 in sight.

<<3 Goals>>

- (1) Local communities where people sparkle
- (2) Industries that look to the world
- (3) Strong and sustainable national land

Chapter 3 Basic Policy on Plan Implementation

Section 1 Plan Period: 10 years from FY 2016 to FY 2025

Section 2 Basic Strategic Approaches

- Maintaining and forming regional structures specific to Hokkaido
 - Forming **basic zones** where people's daily living takes place in **three layered structure: production space, urban district and core city**.
 - **Sapporo Area:** lead Hokkaido as a whole, leveraging its concentration.
- Enhancing Hokkaido's value creation capabilities
 - **People are the resources** in the era of declining population.
 - Improve regional value creation capabilities by developing and utilizing human resources and attracting various people.

Section 3 Plan Implementation Strategies

- (1) Forming multi-layered platforms through industry-academia-government-finance collaboration
 - Develop regional or Hokkaido-wide **industry-academia-government-finance collaboration platforms** according to themes, such as human resources development and regional development, and manage the efforts in a sustainable manner.
- (2) Pioneering and proactive adaptation of innovations—promotion of Hokkaido Initiatives
 - Cover population declines with **technologies** and resolve regional issues innovatively without being caught up with adverse effects.
- (3) Strategic social infrastructure development
 - Demonstrate the **stock effects** of social infrastructure to the maximum extent. Ensure strategic maintenance of infrastructure and enhance efforts to use it smartly, leveraging technological development.
- (4) Plan management
 - Management cycle of "planning → implementation → evaluation → improvement", conducting comprehensive inspections in roughly five years' time.

Source) MLIT

Chapter 4 Key Measures of the Plan

Section 1 Formation of local communities where people sparkle

- (1) Maintaining and enhancing settlement and human interaction environment toward the keeping and formation of Hokkaido-type regional structures.
 - (i) Formation of basic zones
 - (ii) Production space in rural areas
 - (iii) Urban districts in rural areas
 - (iv) Core city in a basic zone
 - (v) Sapporo Area
 - (vi) Promotion of areas around the borders
- (2) Promoting securing and convection of various human resources toward enhanced value creation capabilities of Hokkaido
 - Create society of mutual assistance, secure active population.
 - Human convection with North Japan and overseas.
 - Find and develop human resource for regional development.
- (3) Steady promotion of Northern Territory neighboring region
- (4) Promoting the Ainu Culture, etc.

Section 2 Promotion of Industries that Look to the World

- (1) Promotion of the agriculture, forestry and fishery industries, and the food-related industries
 - (i) Promotion of the agriculture, forestry and fishery industries through innovation
 - (ii) Higher added value of foods and comprehensive base development
 - (iii) Overseas development of foods
 - (iv) Vitalization of rural areas utilizing regional resources
- (2) Formation of tourism sites of the world standard
 - Create appealing world-class tourism areas, further boost tourism consumption of foreign visitors
 - Conditioning the Environment to Host Foreign Tourists
 - Strategic efforts toward the era of inbound tourists
 - Promote venues for MICE, and attract foreign business guests
- (3) Developing industries that take advantage of regional strength
 - Leverage the north's superiority
 - Further development of industry accumulation
 - Vitalize regional economies including local consumption industries
 - Promote investments within the region
 - Develop human/logistics networks that support industries

Section 3 Formation of strong and sustainable national land

- (1) Formation of sustainable local communities that co-exist with rich and abundant nature
 - (i) Securing sustainability of the environment and economy/society
 - Formation of society that co-exist with nature
 - Formation of recycle-oriented society
 - Formation of low-carbon society
 - (ii) Realization of an energy supply/demand structure that has low environmental impact
 - Efforts toward further adoption of renewable energy
 - Efforts based on Hokkaido's regional characteristics such as heating source and automobile fuels
- (2) Contributing to development of strong national land and formation of safe and secure social infrastructure
 - (i) Responding to severer and more diversified disasters
 - Develop systems for protecting human lives
 - Respond to disasters during winter
 - Respond to large-scale natural disasters such as earthquake/tsunami disasters and volcanic eruptions.
 - Respond to flood and landslide disaster risks due to such causes as climate changes.
 - (ii) Contributing to stronger national land for Japan as a whole
 - Secure backup site functions at times of national-scale disaster
 - Secure stable supply of foods at times of disaster
 - (iii) Safe and secure utilization of social infrastructure
 - Promote countermeasures against aging infrastructure
 - Promote traffic safety measures
 - Develop human resources that support the creation of strong national land

(2) Promoting Measures that Support Plan Realization

The new plan was formulated to flesh out specifics of the Grand Design of National Spatial Development towards 2050 in order to respond to various issues surrounding Japan including the coming of drastic population declines in a medium- to long-term perspective. The measures to be promoted include the following.

(i) Local communities where people sparkle

In addition to establishing regional social structures that enable people to continue to live over a long period of time across Hokkaido, covering from vast production spaces that form communities dispersed in wide areas in a scale different from other regions to city areas, it is also important to promote lively convection by attracting various people to Hokkaido whose population is declining ahead of other regions in Japan. To this end, we will drive forward, among other measures, promotion of the agriculture, forestry and fishery industries and the food and tourism related industries, utilization of Michi-no-eki (Roadside Station), creation of bustling and relaxing spaces where people gather, development of communities that are suitable for raising children and comfortable to live, formation of wide-area transportation networks including national high-grade trunk highways, and development of the Hokkaido Value Creation Partnership Activity, which is a wide-area and cross-cutting support and cooperation system for human resources engaged in regional development.

(ii) Industries that look to the world

Hokkaido has competitive advantages in the agriculture, forestry, and fishery industries; the food and tourism related industries; and other industries for export to other regions in the country and other countries; and it is important to develop these industries. Therefore, we will promote, among other measures, the enhancement of productivity by larger division of farmland and other means, creation of a comprehensive base for food by attracting food companies from outside Hokkaido, formation of appealing tourism regions that leverage regional resources, including nature, sceneries, foods, snow, history and culture, by attracting inbound tourism through the Scenic Byway Hokkaido program that encourages round tours and traveling by car, holding of international conferences (MICE) in Hokkaido and the strengthening of functions of New Chitose Airport and strategic international bulk ports including Kushiro Port.

Figure II-4-5-2

Familiarization trip implemented to promote food tourism in Hokkaido by foreign visitors (November 2015, Shibetsu-cho, hands-on salmon caviar making)



Source) MLIT

(iii) Strong and sustainable national land

Hokkaido, which has beautiful and magnificent natural environments and abundant renewable energy sources, is expected to take leading roles in forming sustainable regional society, and it is important for the region to minimize damages in the event of a disaster and contribute to strengthening of Japan as a whole. Therefore, we will promote, among other measures, preservation and regeneration of lakes and wetland, public awareness relating to the formation of hydrogen society through Hokkaido's platform for developing hydrogen communities, fundamental flood control measures and anti-seismic social infrastructure, regional support in the event of a disaster by dispatching TEC-FORCE (Technical Emergency Control Force), establishment of maintenance cycles aimed at extending the service life of social infrastructures, and efforts to enhance safety and reliability of transportation in winter.

2 Promoting Distinctive Regions and Cultures

(1) Promoting the regions neighboring the Northern Territories

Targeting the Northern Territory's neighboring regions where desirable development of regional society is inhibited because of unresolved territorial issues, we are promoting necessary measures in a comprehensive manner under the Seventh Northern Territory Neighboring Regions Revitalization Plan (FY 2013 to FY 2017), which is based on the Act on Special Measures concerning Advancement of Resolution of Northern Territories Issues.

More specifically, the MLIT pursues a mix of structural and non-structural measures to build appealing regional communities in these neighboring regions, including the promotion of agricultural and fishery industries, implementation

of public-works projects for development of transportation systems, supporting the implementation of non-structural measures by providing subsidies for project implementation expenditures, such as for Northern Territory neighboring region revitalization.

(2) Promoting the Ainu Culture, etc.

We are examining action programs, such as hands-on exchanges relating to the tradition of the Ainu in symbolic spaces, in accordance with the Basic Policy on the Development, Management, and Administration of a Space Symbolic of Ethnic Harmony for Promoting the Restoration of Ainu Culture adopted by a Cabinet decision on June 13, 2014. In addition, in light of the effect of the 2020 Tokyo Olympic and Paralympic Games, we will strengthen promotion activities toward the opening of the symbolic space to the general public such as by dissemination of information to overseas people and enhancing exhibitions at airports and other places, setting the goal of 1 million people for the number of visitors to the symbolic space.

In accordance with the Act on the Promotion of Ainu Culture, and Dissemination and Enlightenment of Knowledge about Ainu Tradition, we are working on public awareness activity such as the implementation of “i ran karap te” an Ainu greeting meaning “how are you” Campaign with industry-academia-government collaboration.

Figure II-4-5-3

Lake Poroto and Ainu traditional houses



Source) Ainu Museum

Chapter 5 Creating a Comfortable Living Space

Section 1 Realizing Affluent Residential Living

1 Securing Stability of Residential Living and Advancing its Betterment

In accordance with the new release of the Housing Life Master Plan approved at the March 2011 Cabinet meeting, covering FY 2011 to FY 2020, to reflect the full-scale emergence of an aging society with falling birth-rates, declining population and families, changes in the socio-economic climate such as difficult employment and income environment, needs for housing life support services and more, the MLIT is advancing the implementation of measures aimed at securing the stability of residential living and its betterment with the following goals: a. Building a living environment that supports safe, secure and affluent residential living; b. Proper management and revitalization of housing; c. Preparing the environment for a housing market in which diverse housing needs are properly fulfilled; and d. Assuring the stability of housing for those who require special housing consideration.

(1) Building a living environment that supports safe, secure and affluent residential living

To create safe, secure housing and residential environments, we are advancing earthquake-resistant construction of houses and buildings to be better prepared for large-scale earthquakes, while at the same time promoting “Smart Wellness Residences and Cities,” where different types of residences—such as households with elderly people, households with disabled people, or households raising children—can interact to create places to live that are safe and healthy. It also encourages the construction of housing with better energy-saving performance, utilization of local wood, etc. to get closer to the goal of realizing a low-carbon society.

The MLIT is also keen to preserve and form townscape and scenic beauty to add to the comfort and affluence of residential life, while enhancing the convenience of houses for people like the elderly living in urban areas, based on the concept of universal designs.

(2) Proper management and renewal of housing

Apartments have become a vital mode of housing for the public, with the number of dwelling units stocked reached about 6.13 million (as of the end of 2014). In promoting appropriate maintenance and regeneration of them, we need to respond to various challenges such as shortages of bearers of management associations and failed management due to delinquency in paying service charges on the back of aging population and other changes.

Therefore, in March 2016, we revised the Standard Apartment House Management Bylaws that set forth, among other things, use of external specialists, measures against delinquency in payment of service charges, and disclosure of building management status.

In order to facilitate the renewal of aging apartment buildings, the “Law to Revise a Part of Laws related to the Facilitation of the Reconstruction of Apartment Buildings”—which contains the establishment of an apartment building premises sale system as well as special provision for easing the floor-area ratio—was established in June 2014 and put into effect in December of the same year.

Furthermore, the Bill to Partially Amend the Act on Special Measures concerning Urban Reconstruction was decided by the Cabinet in February 2016 and submitted to the Diet.

(3) Preparing the environment for a housing market in which diverse housing needs are properly fulfilled

a. Preparing a market that facilitates the smooth trading of existing houses

Based on the “Used Housing/Renovation Total Plan” (March 2012) and the “Research Report on the Distribution Promotion/Utilization of Used Housing” (June 2013), efforts of (a) and (b) were promoted to set up a market that facilitates

the use of existing housing.

In addition to improving the building evaluation technique, in order to establish said improvements in the existing housing market and the home financing market, the “Used Housings Market Activation Roundtable” was held from September 2013 as a means for the private businesses and financial institutions involved in the existing housing distribution to exchange opinions. In March 2015 the results from these discussions were summarized in the “Used Housings Market Activation Roundtable Report”.

In addition, the FY 2014 tax reform expanded the scope of existing houses qualifying for special tax treatments (such as tax credit for residential mortgages) to include those to which earthquake resistant retrofitting works were conducted after acquisition, irrespective of the limitation on the number of years from construction. Also, in the FY 2014 revision to the taxation system, a preferential measure for the registration license tax related to housing purchases in the buyback-resale business was created as a potential catalyst for expanding the existing housing/renovation market, and the FY 2016 tax reform extended the application for an additional two-year period. Further, in the FY 2015 revision to the taxation system, a new measure was created to reduce the real estate acquisition tax that is imposed on the buyback-resale businesses.

(a) Preparing the market environment in which consumers can remodel their homes without worry

Consumers planning to remodel their homes are concerned about how much the remodeling will cost them and how to select the right contractors. Reassuring worried consumers is essential to expanding the home remodeling market.

Efforts currently taken in this regard include the Check Quoted Remodeling Costs for Free service available from the Housing Telephone Consultation Desk at the Center for Housing Renovation and Dispute Settlement Support, in which consumers can receive consultation on specific quotations, and Free Expert Consultation Programs at local bar associations. In FY 2015, there were 9,836 telephone inquiries regarding remodeling, 820 calls for checking quoted remodeling costs, and 899 calls for expert consultation regarding remodeling.

In FY 2015, there were 3,421 subscriptions to the Remodeling Defect Liability Insurance Program, an insurance package that combines an inspection on remodeling works in progress with warranties against possible defects in the works, and subscriptions to the large-scale repair work liability insurance program for large-scale apartment building repairs were filed for 955 apartments.

Contractors seeking to be insured are registered with the Housing Defect Liability Insurance Corporation, subject to their possession of a construction business license, proven performance, etc. The Program allows consumers to browse through a list of registered contractors at an Association of Housing Warranty Insurance website as a helpful tool in choosing contractors.

Further, under the “Housing Renovation Business Organization Registration System”, we are working on building an environment where there is a healthy development of the housing renovation business and consumers renovate their homes with confidence, by having housing renovation business operators that meet certain standards registered to ensure that the work of housing renovation businesses is properly managed and information can be provided to the consumers.

(b) Developing a market environment in which consumers can purchase existing houses without worry

Consumers who consider the purchase of existing housing may worry about the quality and performance of housing. Therefore, to expand the existing housing distribution market, it is necessary to build an environment where consumers can purchase an existing house without worry.

In order to do this, we are promoting the popularization of appropriate inspections based on the “Existing Housing Inspection Guidelines” (established in June 2013), which are guidelines pertaining to the inspection of current state of housing, so that consumers can get a grasp on the condition of the existing housing.

In terms of the Existing Housing Sale Warranty Insurance System, an insurance package that covers both inspections and warranty to defects, there is a growing variation in insurance products—such as the new insurance product developed in FY 2013 which has a shorter coverage period but is relatively inexpensive—which has resulted in an gradual increase in the number of subscriptions to 9,309 in FY 2015.

Like the Remodeling Defect Liability Insurance Program, the Existing Housing Defect Liability Insurance Program allows consumers to search through a list of registered traders at a website to aid in their trader selection.

b. Forming long-lasting quality stocks

(a) Housing quality assurance

A 10-year defect liability obligation has been mandated for the basic structural part of new housing in accordance with the “Housing Quality Assurance Promotion Act”. At the same time, a housing performance marking program has been put into effect for objective assessment of the basic performance characteristics of new and existing houses, such as earthquake-resistance, energy-saving measures, preventing measures against deterioration, etc. In FY 2015, Housing Design Performance Assessment Reports were issued for 200,050 houses to assess them in their stage of design documentation, Constructed Housing Performance Assessment Reports (New House) were issued for 168,514 houses to evaluate them on-site inspection, and Constructed Housing Performance Assessment Reports (Existing House) were issued for 388 existing houses.

Disputes arising in connection with houses that have been subjected to a constructed housing performance evaluation are to be promptly and legitimately settled by local bar associations that are a designated housing dispute settlement agency, with support from the Center for Housing Renovation and Dispute Settlement Support. The Center also accepts applications for consultation on housing issues. In FY 2015, there were 31 cases of application for dispute processing regarding a house for which a constructed housing performance evaluation report was issued by designated housing dispute processing agency, and 900 cases of consultation regarding a house for which a constructed housing performance evaluation report was issued by the same center.

(b) Approaches to longer-lasting housing

The MLIT pursues the dissemination of housing that is structured and equipped to meet or exceed certain levels of performance requirements, such as durability and ease of maintenance and management (“Long-lasting Quality Housing”) under the Act on the Promotion of Dissemination of Long-Lasting Quality Housing. (Certified houses in FY 2015: 104,633).

We are also supporting progressive approaches to renovation that contributes to the longevity of existing housing.

(c) Promotion of wooden housing

Based on the needs of the public for wooden houses, such as that more than 70% of the public prefer wooden houses ^{Note}, the MLIT supports not only the construction of long-lasting quality wooden housing, certified low-carbon housing and zero-energy housing by a group of contractors working in the entire process of housing, from supplying local timber and other materials, to designing and constructing housing, but also the development of human resources relevant to the construction of wooden housing, with the aim of creating quality wooden housing stock.

In addition, in order to develop general methods of designing buildings using CLT in early FY 2016, technical examinations such as full-size testing are ongoing.

Note Surveys on awareness and preferences concerning the cyclical use of forest resources by the Ministry of Agriculture (FY 2015)

c. Making housing available to fill varied dwelling needs and closing gaps between supply and demand for housing

(a) Home financing

The Japan Housing Finance Agency offers securitization support businesses to support the availability of long-term, relatively low fixed-rate mortgages from private financial institutions. Its operations include Flat 35 (Purchase Program) that consolidates housing loan receivables of private financial institutions and Flat 35 (Guarantee Program) which supports the private financial institutions themselves becoming the originator ^{Note 1} to handle the securitization. The performance result for Flat 35 (Purchase Program) up to the end of March 2016 was 1,067,575 cases of purchase applications and 750,537 cases of successful purchase, with 331 financial institutions participating. The performance result for Flat 35 (Guarantee Program) up to the end of March 2016 was 20,148 applications for insurance coverage and 12,416 cases receiving insurance coverage, with 5 financial institutions participating.

For houses that are entitled to Flat 35, property inspections are carried out against a defined set of technical requirements, such as durability, to assure their quality. In addition, the framework of the securitization support service has been leveraged to launch Flat 35S, which reduces the interest rate of the loan on the acquisition of houses that meet any one of the performance requirements: earthquake-resistance, energy-saving performance, barrier-free readiness, and durability/modifiability, for the first years of its repayment (for the first 10 years for long-lasting quality housing).

The Agency also provides services in those areas that are politically significant but that cannot be easily conducted by private financial institutions, such as financing housing designed for disaster recovery or elderly rental housing with supportive services.

(b) Housing Tax System

In the FY 2016 tax reform, a system was created for the special deduction of 30 million yen applicable to capital gains if an old vacant house inherited (limited to earthquake resistant houses) or land after removing the house was transferred, in light of preventing adverse effects caused by abandoned houses to the living environment around them. In addition, from the perspective of promoting the development of an environment where raising a child is made easier by cross-generational support, a tax reduction system is created for housing renovations for three-generation households financed by a loan or buyer's own funds. Furthermore, in view of reducing the initial burden of those who acquire housing, improving residential standards and forming quality housing stock, the application of property tax reduction for new housing was extended for two years until March 31, 2018.

Furthermore, measures to deal with a possible recoil reduction from the planned consumption tax increase by 10% in April 2017 will be taken, which include the expansion of housing cash benefit (raising the maximum amount from JPY300,000 to JPY500,000) and the tax-free measure for gift tax (raising the maximum amount from JPY15 million to JPY 30 million), in addition to a significant hike in the home buyer's tax break. It is hoped that with these measures in place, the housing acquisition of the younger generation will be promoted and the predictability will get higher for those who are considering housing acquisitions, and that these factors will contribute to the stabilization of the housing market.

(c) Preparing the rental housing market

To improve the stocks of owner-occupied houses, such as stand-alone houses and condominium apartments, by making them available for rent in the rental housing market, the MLIT is working to prepare the rental housing market by disseminating the fixed-term housing rental system, and developing DIY type lease ^{Note 2} guideline.

Note 1 A business enterprise that possesses assets to be liquidated. An originator raises funds by securitizing its assets, by transferring its credit, real estate properties, etc. to a special-purpose company.

Note 2 DIY-type lease means a lease contract or its lease property where remodeling and renovation may be made to reflect the preferences of lessor (tenant) regardless of who bears the DIY expenses. DIY stands for "do it yourself", and usually means doing your own repairs, assembling, and home carpentry without the help of professionals, but in this case includes instances where the tenant hires a professional to make facility improvements or remodeling according to his/her own preferences.

(d) Promotion of measures for vacant houses

The Vacant Houses Special Measures Act was fully enforced in May 2015. Municipal governments are driving forward the Vacant Housing Countermeasure Plan according to their local circumstances, as well as use and removal of vacant houses and buildings.

(4) Assuring housing stability for those who require special consideration for housing

a. Supply of public rental housing

To deliver public housing supplied by local governments to low-income earners in serious need of housing, and to promote the supply of quality rental housing to households consisting of elderly people who need special consideration to stabilize their housing, the MLIT set up the Regional Excellent Rental Housing Program as a scheme that complements the public housing and subsidizes the expenses incurred for the development of public rental housing and also for the reduction of the rents.

In addition, in order to secure a housing safety net for persons who are forced to leave their homes for such reasons as dismissal from work, we have taken measures to ensure stable housing for displaced workers, including the simplification of procedures for allowing such workers who are not originally eligible to use vacant public housing and other such facilities.

Figure II-5-1-1 Purposes and Results of Public Rental Housing

	Purpose	Number of houses managed
Public housing	Supplies quality rental housing to low-income earners who are in serious need of housing with low rent.	About 2.16 million houses (FY 2014)
Improved housing	Supplies public rental housing to existing residents who are in serious need of housing in a deteriorated residential area.	About 150,000 houses (FY 2014)
UR Rental Housing	Supplies quality rental housing that is conveniently located for access to work, focusing on family-oriented rental housing hardly in ample supply from private business entrepreneurs, in major urban areas, as well as develops residential districts (since FY 2002, a privately supplied support rental housing program has been launched to support the supply of family-oriented rental housing from private business entrepreneurs)	About 750,000 houses (FY 2014)
Agency rental housing	Supplies quality rental housing to meet the regional demand for rental housing	About 130,000 houses (FY 2014)
Regional excellent rental housing	Provides subsidies to private land owners to fund maintenance and other expenses and cover rent cuts to provide quality rental housing for households consisting of elderly people, child-raising families, etc.	- About 122,000 designated excellent rental houses (FY2014) - About 41,000 designated excellent rental houses for elderly people (FY2014)

(Notes) 1 The number of rental houses managed by the Urban Renaissance Agency includes the subsidized rental housing with high quality for elderly.

2 The number of public rental housings does not include those of the Specified Good Rental Housings and Subsidized Rental Housings with High Quality for Elderly.

3 The Specified Good Rental Housings Institution and Subsidized Rental Housing with High Quality for Elderly Institution were reorganized and the Regional Good Rental Housings Institution established in FY2007.

(Source) MLIT

b. Using private rental housing

In order to facilitate the promotion of smooth move-ins to private rental housing by people such as the elderly, disabled, foreigners and families with small children, we are providing housing assistance such as information services and consultation services through the Housing Assistance Council (60 councils (46 prefectures and 14 cities) established as of the end of FY 2015), which is made up of local government, real estate related organizations and housing assistance organizations.

2 Supply and Utilization of Good Housing Land

(1) Land price trends

The official land prices in Japan for 2016 (as of January 1, 2016) showed that the average residential land price declined but the rate of decline was smaller compared to the previous year, while the average commercial land price increased by 0.9%, compared to 0.0% in the previous year. The average land price of all categories of land use rose for the first time in 8 years since 2008. Land prices in major metropolitan areas increased slightly for residential land, and commercial land price rose for three consecutive years. In regional cities, both residential land and commercial land prices continued to decline, but the rate of decline was smaller, and the average land price of 4 cities—Sapporo-shi, Sendai-shi, Hiroshima-shi and Fukuoka-shi—showed an increase that is higher than that of the three major metropolitan areas for both residential

land and commercial land.

(2) Present status and problems in housing land supply

We are steadily implementing housing land measures based on population and household trends. The Urban Renaissance Agency now works only on the new town projects that have already been initiated. The MLIT also supports the development of public facilities relevant to the development of housing land, and offers preferential tax measures to promote the supply of housing land furnished with a good dwelling environment.

(3) Using fixed-term land leases

A fixed-term land lease—in which the land lease ends for certain at the determined contract term and there is no renewal of the land lease—is an effective system for making residential acquisition at a low cost possible.

In order to spread this system smoothly, we are clarified, among other things, the tax treatment of the system for paying a rent as an up-front lump sum.

(4) Revitalizing aging new towns

The large-scale urban housing areas (New Town) that were systematically developed mainly in the suburbs of the metropolitan areas during the economic boom period are facing issues of decline in community vitality resulting from the quickly aging population and the continued decrease in population. There is a growing need for renewing the dilapidated housing and communal facilities as well as improving the functions that support daily life, in order to renovate these new town areas into cities that are easy to live in for everyone.

Also, with the aim of contributing to the revitalization of aging new towns, we are providing information on the methods and case examples of initiatives by residents, business proprietors and landowners/leaseholders for maintaining and enhancing a good regional environment and regional value.

Section 2 Realizing Comfortable Living Environments

1 Developing City Parks and Forming a Good Urban Environment

(1) Status of development of city parks and approaches to upgrading them

Because city parks are key facilities laid out to fill diversified public needs, national government parks, the development of national government parks, disaster preparedness parks, and the preservation of time-honored cities and green spaces have been implemented efficiently and on a planned basis, with primary emphasis on: a. Building a safe and secure municipality furnished with disaster preparedness parks that could serve as evacuation sites; b. Building safe and secure community sites to address the issues of an aging population with falling birthrates; c. Preserving and shaping a good natural environment that aids in building a recycling-oriented society and addressing global environmental issues; and d. Building sites for advancing tourism that takes advantage of regional characteristics or for inter-regional exchanges or collaboration.

Figure II-5-2-1

Miharashi Hills of Hitachi Seaside Parke, a reviving tourism base (Hitachinaka-shi, Ibaraki)



Source| MLIT

As of the end of FY 2014, city parks were maintained at 105,744 locations nationwide, covering 122,839ha, or about 10.2m² per capita. National parks were visited by about 40.29 million people in the year as of the end of FY 2015, with 17 locations being developed and maintained.

(2) Forming a green urban environment

The MLIT is providing comprehensive support in financial and technical aspects, pursuant to the initiatives based on the “Green Master Plan” formulated by municipalities to properly respond to the global environmental issues, such as global warming and biodiversity preservation, and to aim at realizing green-rich city environment by preserving and forming a good natural environment. Specifically, the MLIT is promoting preservation of greenery by advancing the development of green-rich city parks using the social capital development general grant, etc., and utilizing the Special Green Space Conservation District Program, which aims to protect planting of greenery by restricting the construction of buildings or purchasing land, and the Citizen Green Space Program, which makes green spaces available to citizens under contract. Greening of private land is also being promoted through the Green Space System and the District Plan Greening Ratio Ordinance System. Furthermore, we are facilitating the conservation of multi-function agricultural land within urban areas through the Production Greenland Area System.

Along with holding events like national “Protecting Greenery” gatherings and National City Greening Fairs to gain public awareness regarding greening, MLIT is working on various measures such as awarding certificates of commendation for people promoting greening, as well as evaluating/certifying greening/green area conservation efforts by businesses.

(3) Efforts toward city’s co-existence with greenery and agriculture

In response to growing appreciation of diverse functions of urban agriculture and other factors, the Basic Act on Promotion of Urban Agriculture was established in April 2015, and the Basic Plan on Promotion of Urban Agriculture is being developed in cooperation with the Ministry of Agriculture.

In addition, we are making efforts to realize city development where cities co-exist with greenery and agriculture, such as by surveying on initiatives that contribute to formation of good urban environments that are in harmony with greenery and agriculture and the demonstration of diverse functions of urban city.

2 Advancing Roads that Prioritize Pedestrians and Bicycle Riders

a. Creating people-oriented, safe, and secure walking spaces

To achieve social safety and security, it is important to make people-oriented walking spaces that assure pedestrian safety. In particular, based on the results of an emergency joint inspection that was carried out in FY 2012, we are advancing efforts to improve school routes used by children who walk to school. Schools, the Board of Education, road administrators, police, and other related organizations have worked together to implement traffic safety measures such as maintaining sidewalks, painting colors on curbs, and installing guardrails, as well as implementing joint periodic inspections based on the “School Route Traffic Safety Program” to ensure the safety and security of children through these enhanced measures.

b. Creating a safe and comfortable cycling environment

Bicycles play important roles as accessible means of transportation, but the number of accidents that involve bicycle and pedestrian remains high in the past 10 years while the total number of traffic accidents decreased by 40 percent during the same period. This indicates we need a safer, more comfortable environment for cyclists. In light of this, the MLIT is promoting efforts to create a safe and comfortable environment for cyclists by promulgating the “Guidelines for Creating a Safe and Comfortable Cycling Environment” (November 2012, MLIT, National Police Agency), so that municipalities are encouraged to work on the formulation of bicycle network plans and development by such means as reallocating road space.

c. Developing quality walking spaces

The MLIT supports the development of pedestrian roads and rest facilities that create high quality pedestrian environments and that also tie together rich scenery and abundant nature with historical sites, in order to develop regions that are attractive and that promote health through walking.

d. Developing road signs that are easy to understand

The MLIT is working on the installation of road signs that are easy to understand to help guide pedestrians who are in an unfamiliar place to their destinations.

e. Building a flexible system of road administration

To implement a flexible system of road administration that provides a diversity of road functions tailored to the needs of the local residents -- including safe walking spaces and places of regional buoyancy and human exchange, and making motor-vehicle traffic smoother and safer -- the MLIT is implementing: (a) preferential measures, such as the construction of new sidewalks on national or prefectural highways by municipalities other than the designated cities; (b) a system for suggesting that municipalities refurbish pedestrian safety facilities; (c) preferential measures for road occupancy, such as boulevard trees planted by NPOs or others, street lamps, etc.; and (d) preferential measures for the administration of off-street convenience facilities to keep roads and roadside facilities under integrated management.

Section 3 Realizing Traffic with Enhanced Convenience

(1) Advancing implementation of integrated urban/regional traffic strategies

Intensive city planning that ensures safe, smooth traffic requires a cross-sectional approach to the available transportation modes—such as cycling, railway, and bus—from users’ standpoint, rather than reviewing the transportation modes or their operators individually. To this end, each local government should inaugurate a council composed of public transportation operators and other stakeholders and let the council define a future vision of its cities and regions, and the types of transportation services to be made available, so that it can formulate “Integrated Urban/Regional Transportation Strategies” that cover relevant traffic measures and working programs (as of March 2016, Integrated Urban/Regional Transport Strategies had been formulated or were being formulated in 82 cities), with the stakeholders taking their respective shares of responsibility for implementing measures or projects. The national government is expected to support the implementation of integrated and strategic packages of traffic projects, such as the development of LRT ^{Note} pursued according to the Strategies, and city planning programs.

(2) Approaches to improve public transportation usage environment

For local public transportation, the MLIT supports the deployment of LRT, BRT, IC cards and other less constrained systems through the implementation of regional public transportation assurance, maintenance and improvement projects, to accelerate the improvement of regional public transportation usage environment as part of its barrier-free community planning effort. In FY 2015, Hiroshima Electric Railway Company deployed light rail vehicles.

(3) Upgrading urban railway networks

Urban railway networks have upgraded to a considerable extent to date as they have been refurbished with a primary view to building up their transportation capacities to ease traffic congestion. As a result, traffic congestion in the major metropolitan areas during commuting to and from office or school by train is on the decline, keeping pace with the continuing trends towards an aging population with fewer births. The rate of congestion on some routes, however, remains as high as over 180% and demands continued efforts to mitigate congestion. Efforts in progress include quadruple tracking of Odakyu Electric Railway’s Odawara Line and modifications to Tokyu’s Toyoko Line, both funded by the Designated Urban Railway Development Reserve Program.

The Kanagawa Eastern lines (Sotetsu - JR/Tokyu Through line) and others have been developed by leveraging the “Act

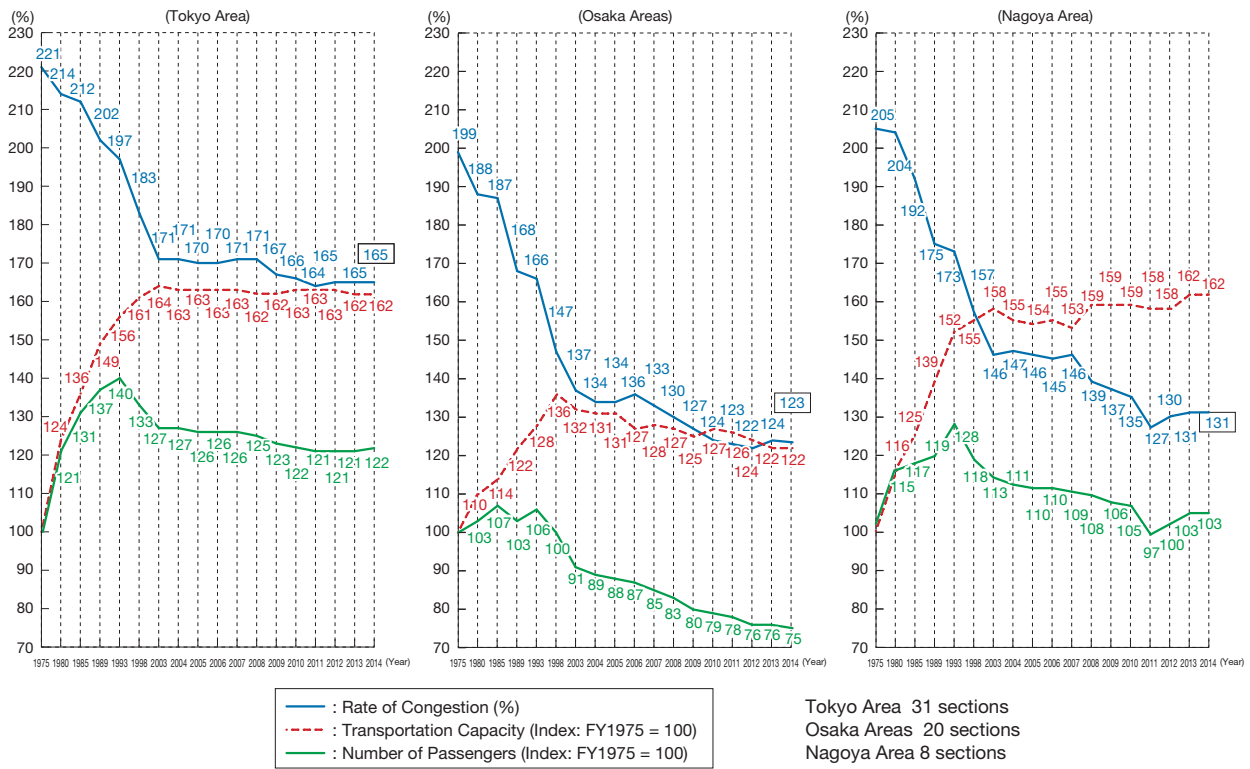
Note Short for Light Rail Transit. A next-generation rail transit system that offers excellent characteristics derived from the use of light rail vehicles (LRV), improvements to rails or stops—such as ease of getting on and out—, punctuality, speediness and passenger comfort.

on Enhancement of Convenience of Urban Railways, etc.”, a legislation aimed at upgrading the speediness and traffic node functions of existing urban railway networks, to further enhance the urban railway networks, including added user convenience.

Furthermore, the Council of Transport Policy is examining the future of the urban railway in the Tokyo Metropolitan Area which was referred to the Council in April 2014.

Figure II-5-3-1

Changes in the Average Rate of Congestion, Transportation Capacity and Passenger Capacity in the Three Major Metropolitan Areas (Index: FY 1975 = 100)

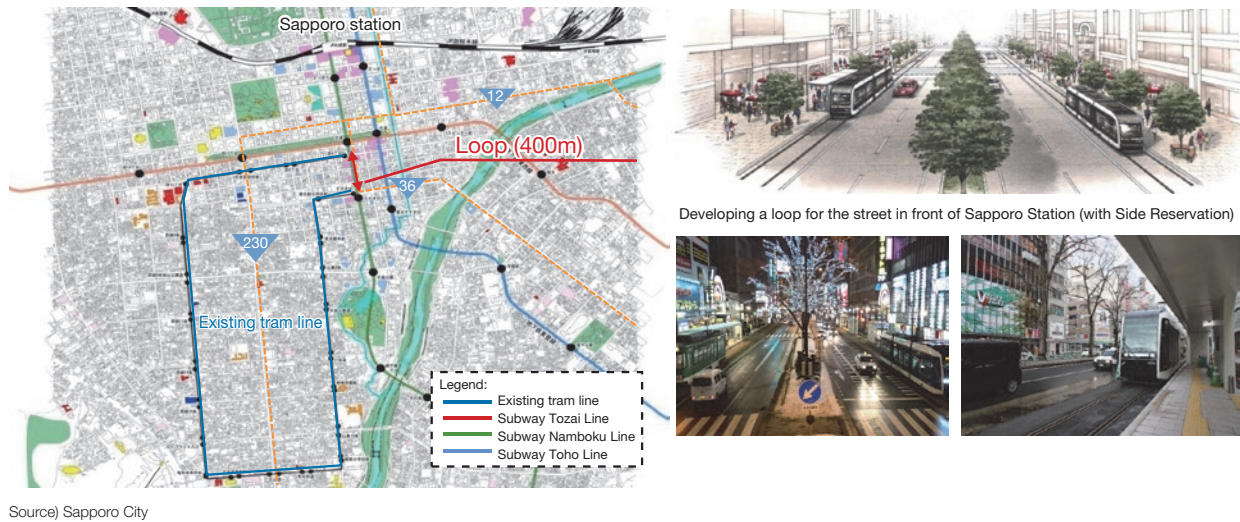


Source) Prepared by the MLIT from "Urban Transport Annual Report" compiled by the Institution for Transport Policy Studies and other relevant literature

(4) Development of urban monorails, new transport systems, and LRTs

The MLIT promotes the development of LRTs to encourage users' migration to public transportation facilities in order to streamline urban traffic flow, lighten environmental loads, and revitalize central urban areas, while keeping vulnerable road users assured of mobility in this era of aging population and falling birthrates. In FY 2015, various cities moved forward with the renovation of public transportation networks. For example, Sapporo-City opened sections where a loop to connect the existing streetcar lines was built; Toyama-City connected the south side and north side of Toyama Station with streetcars; and Fukui-City moved forward with developing mutual accessibility between the streetcar line and the railway.

Figure II-5-3-2 Loop Development (Sapporo-City)



(5) Augmenting the convenience of bus usage

The convenience of bus usage has been augmented by improving the punctuality and speediness features of bus services by using a Public Transportation Priority System (PTPS) and bus lanes, introducing bus location systems that provide information about the location of buses in service, and IC card systems that facilitate smooth boarding and disembarking.

Chapter 6

Building Competitive Economy and Society

Section 1

Constructing Traffic Networks

1 Developing trunk road networks

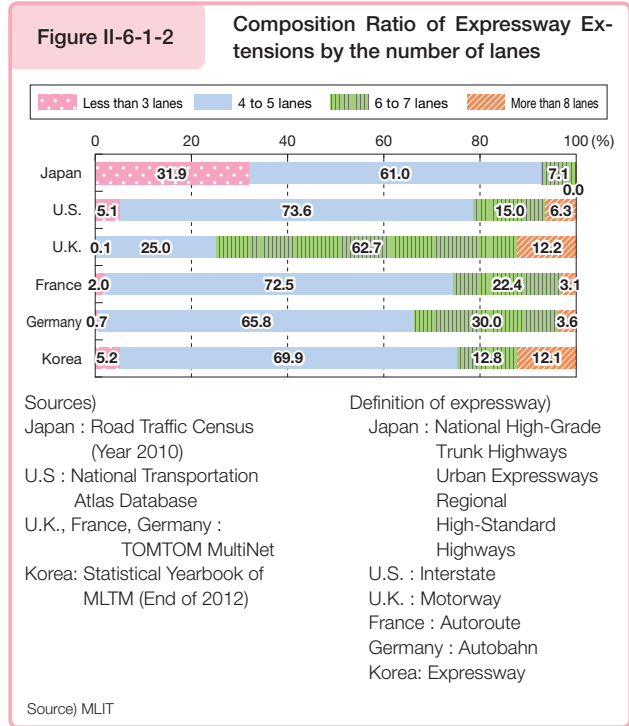
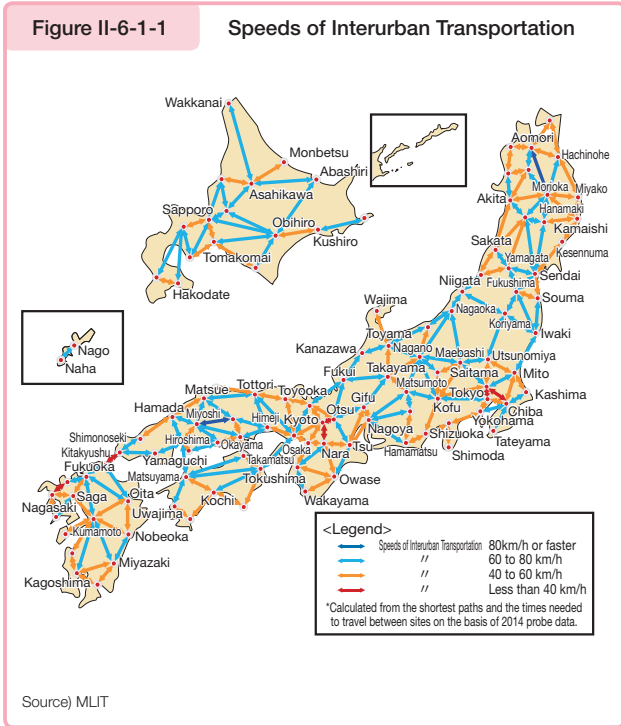
(1) Developing trunk road networks

Since the First Five-Year Road Construction Plan formulated in 1954, Japanese highways have been continually constructed. For example, the construction of national highway networks, including expressways, has provided a major impetus in the rejuvenation of regional economies by encouraging plant locations near expressway interchanges. Additionally, it has helped enhance the quality and safety of national life by making broad-area medical services accessible to rural areas and allowing broad rerouting to avoid highway disruption by natural disasters.

For example, all sections of the Metropolitan Intercity Expressway in Saitama Prefecture were opened to traffic in FY 2015. The Metropolitan Intercity Expressway (Ken-O Expressway) is the outermost expressway in the Three Ring Roads that are under development in the Tokyo Metropolitan Area and connects Tomei Expressway and Tohoku Expressway, which allows drivers to reach their destinations avoiding traffic congestion in the center of Tokyo, promotes tourism and improves productivity for companies located along the expressway.

In the meantime, the speed of interurban transportation, an indicator of the speediness of interurban travel, tends to lag in the areas in which trunk road networks are underdeveloped. While European and U.S. freeways each have at least four lanes on average, freeways that have only one lane in either direction account for 30% or more of all freeways in Japan.

Freeways are less vulnerable to accidents involving human casualties than general highways with a probability of about 1 in 10. In addition, they have about two-thirds of the carbon dioxide emissions and about seven times more cars running per lane. Freeways are not only “safe and clean” but serve as a “path to life” in times of disaster. The MLIT is committed to firmly linking freeway networks together and promoting a framework to use them wisely.



(2) Promoting smart use of the roads

In order to achieve road traffic service that is smooth, safe, comfortable and contributes to increasing area vitality, MLIT is moving forward with efforts to further improve the functionality of existing roads by developing necessary networks, as well as improving operations and small-scale enhancements. Electronic toll collection (ETC) 2.0 is one of these efforts, which started full service in August 2015.

(i) ETC 2.0 that supports smart use

With data communication in both ways between about 1,600 communication spots on roads across Japan and vehicles on road, ETC 2.0 compared to the previous version of ETC is capable of:

- Sending and receiving a large volume of data
- Capturing route information, in addition to IC entry/exit data

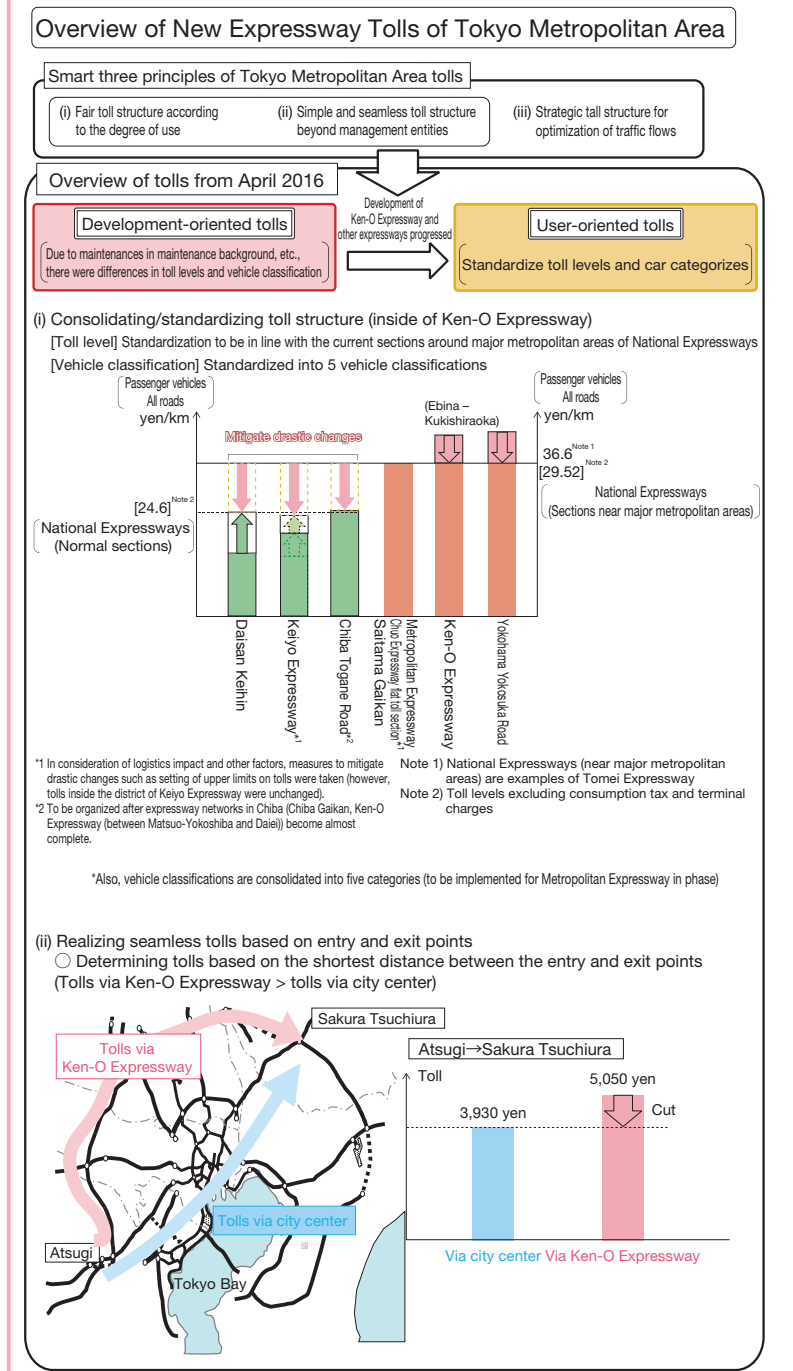
With these much more advanced functionalities, ETC 2.0 greatly contributes to the promotion of ITS.

(ii) Smart toll system

In response to recommendations in the interim report of the MLIT's Arterial Road Committee of the Panel on Infrastructure Development, a new toll system was introduced to expressways in the Tokyo Metropolitan Area in April 2016, which involved re-organizing and standardizing toll levels among all expressways based on the origin and destination. The Committee is now reviewing the toll system for the Kinki Area.

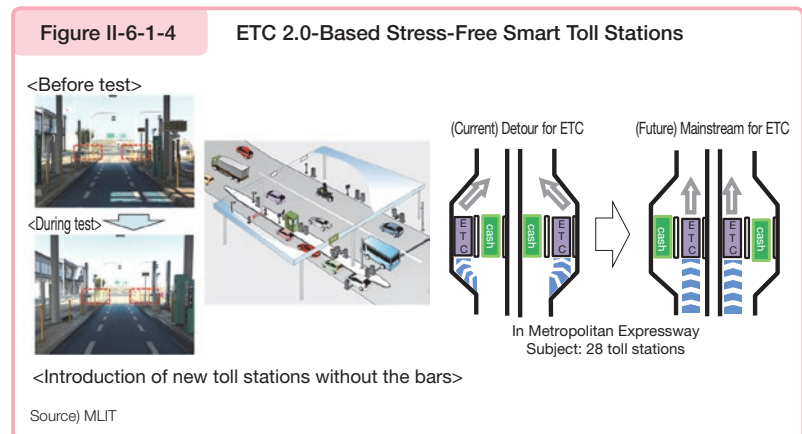
In Japan, there are 83 sections that have no gas station at an interval of 100 km on the expressways, which need improvements on the service levels. This prompted to conduct a pilot program starting in April 2015 where terminal charges are exempted for drivers who exit at Muikaichi IC or Yoshiwa IC on the Chugoku Expressway for refuel. This experiment was made possible by an ETC2.0 feature that provides area-wide route information including general roads.

Figure II-6-1-3 Overview of New Expressway Tolls of Tokyo Metropolitan Area



(iii) Smart toll stations

Towards introduction of stress-free smart toll stations based on ETC, we are experimenting with the operation of keeping ETC bars open at the toll stations of Ken-O Expressway (Okegawa-Kitamoto IC, Sayama Hidaka IC) and mainstream use of ETC lanes at the Sangenjaya and other entries ahead of full implementation for Metropolitan Expressway.



(iv) Smart investments

As part of efforts to achieve maximum effect with the existing networks at minimum cost, we are implementing an initiative to identify places where deceleration or traffic congestion occurs from structural factors, such as uphill sections and tunnels, by using detailed deceleration, acceleration, and other big data collected through ETC 2.0 and other means for effective measures. Around Chofu on the inbound lane of Chuo Expressway, an additional lane was established within the existing road width at the Chofu IC junction, a slow zone/rising slope around Jindai Temple BS and other sections, and started operation of three lanes from December 2015. In addition, for the Ebina junction of Tomei Expressway, two-lane operation on the existing road width began in October 2015 at the ramp junction area, where one-lane operation had caused congestion.

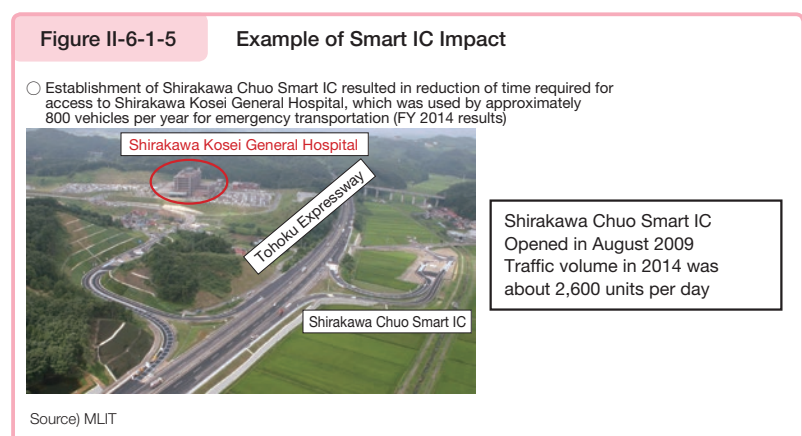
(v) Enhancement of smart functions

About 30% of expressways in Japan have only two lanes as a tentative provision, which create issues of two way traffic safety and travel performance, and large-scale disaster response. Therefore, in light of enhancing the safety and comfort of drivers and driving performance, a Cabinet Order to Partially Amend the Enforcement Order for the National Expressway Act was decided by the Cabinet on November 13, 2015. The amendment enables flexible action when changing tentative two lanes to four lanes without going through discussions at the MLIT Arterial Road Development Council, on the condition of having discussions at a third party committee and meeting other requirements.

(vi) Other initiatives

In order to promote cooperation among local areas, the MLIT is improving accessibility, including direct connections between expressways and facilities. By being flexible in building additional Smart ICs, we are increasing accessibility to the distribution centers and tourism hubs from expressways through the consolidation and sophistication of measures based on the concept of “compact” and “networked” roads and reducing traffic congestion around the existing ICs. In view of

promoting the use of expressways and improving usability, the MLIT is organizing new rules, such as directly connecting expressways and large-scale distribution centers, industrial complexes, and commercial facilities near the expressways by using Smart ICs and other means with appropriate assumption of burden. In this fiscal year, the national government newly instituted preparation phase surveys for Smart ICs in places where necessity is found and is implementing the preparation and examination of Smart ICs in systematic and efficient manner.



Column Inspection of business of expressway organizations and companies

On the 10th anniversary of the privatization of expressway organizations and companies in October, 2005, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) conducted inspections of the past performance and issues of Japan Expressway Holding and Debt Repayment Agency and other Expressway Companies, and the measures necessary for their futures, and then put together the results as the inspection of business of expressway organizations and companies.

The document summarized the major performance and issues of the past 10 years, such as (i) reliable redemption of debt, (ii) attainment of operation ahead of the schedule or reduction of costs by exercising the flexibility and mobility, and (iii) improvement and diversification of the services by use of knowhow from the private sector.

As for tasks that the Agency and Companies should tackle from now on, it has been confirmed that, while steadily achieving results according to the purposes of privatization, they need to make tireless efforts to address new issues, such as prevention and mitigation of disasters, and take measures against deterioration in order to provide safe and secure services.

They are also required to actively promote measures for smarter use of expressways, aiming to maximize the stock effects of the expressways and to grow the Japanese economy through enhancement of international competitiveness, and regional revitalization.

Inspections on Operation of Japan Expressway Holding and Debt Repayment Agency/Companies—Major Achievements and Issues after Privatization

Purpose of Privatization	(i) Ensuring repayment of interest-bearing debts	(ii) Early maintenance with minimal burden of the public	(iii) Provision of various services by leveraging private-sector know-how
Major achievements	<p><u>Steady repayment of interest-bearing debts</u></p> <p>37.4 trillion yen (At the time of privatization)</p> <p>29.3 trillion yen (Beginning of FY 2014)</p>	<p><u>Companies demonstrated agility and flexibility, achieving early opening to traffic and cost reductions</u></p> <p>[Opening] ⇒ pushed forward by 4 months on average</p> <ul style="list-style-type: none"> - New Tomei Expressway (between Gotenba JCT and Hamamatsu Inasa JCT) ⇒ advanced by about 12 months - Kita-Kanto Expressway (between Mooka IC and Sakuragawa-Chikusai IC) ⇒ advanced by about 11.5 months <p>[Cost reduction] ⇒ cut by about 740 billion yen</p> <ul style="list-style-type: none"> - Higashi Kyushu Expressway (Hyuga IC to Tsuno IC) ⇒ cut by about 25 billion yen - Metropolitan Expressway Central Circular Shinagawa Route (between Oij JCT and Ohashi JCT) ⇒ cut by about 34 billion yen 	<p><u>Better services at SAs/PAs with diversified shops and enhanced facilities</u></p> <p>[Diversification of shops]</p> <ul style="list-style-type: none"> - Convenience store - Café - Food court <p>[Enhanced facilities]</p> <ul style="list-style-type: none"> - Washlet toilet - Accommodation facilities - Dog run <p>[Sales of SAs/PAs]</p> <ul style="list-style-type: none"> - About 400 billion yen (at the time of privatization) ⇒ about 490 billion yen (2014)
	Major issues	<p>■ <u>Major disasters (e.g., Great East Japan Earthquake, heavy snow) and accidents (e.g., falling of Sasako Tunnel ceiling, reverse run by elderly drivers) happened during the 10 years after privatization.</u></p> <p>Enhanced countermeasures against aging infrastructures, increasingly frequent large-scale disasters and accidents should be taken in order to provide safe and secure services.</p> <p>➢ Driving forward systematic countermeasures against aging infrastructure based on regular inspections that became mandatory under the revised Road Act, and other regulations, and implementation of large-scale renovation works projects (for Metropolitan Expressway from 2014)</p>	
Opinions of review meeting	<p>■ Basic frameworks which steadily made positive results so far should be continued in the immediate future.</p> <p>■ Based on heightened awareness of the public about safe and secure passages due to major disasters and accidents occurred after privatization, express institutions/companies need to take active roles in society more than ever.</p> <p>■ Going forward, these roles, which were not stipulated at the time of privatization, need to be handled appropriately, in addition to the privatization objectives.</p>		

Source) MLIT

2 Constructing arterial railway networks

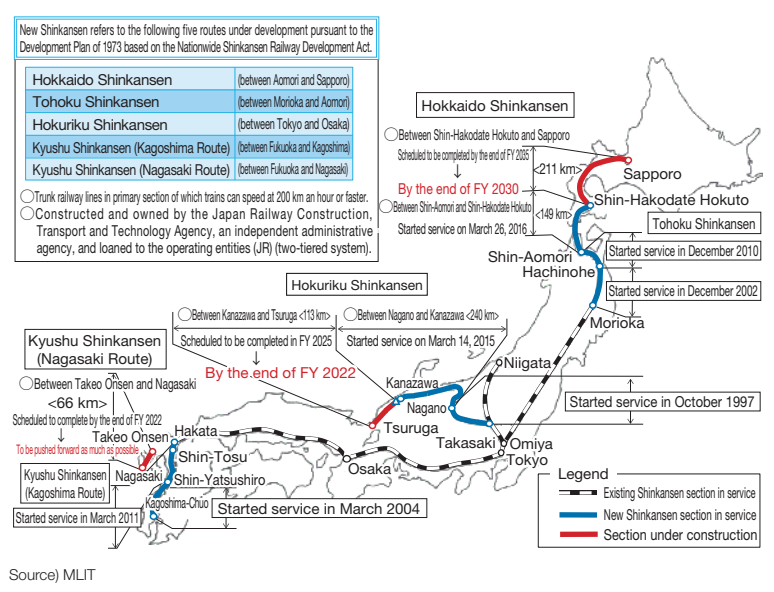
(1) Development of Shinkansen railways

A rapid transit system of vital value to Japan, Shinkansen [bullet train] Lines significantly cut the time spent moving from region to region and help greatly boost regional activities and rejuvenate local economies. Shinkansen Lines feature safety (no record of passenger death accidents since opening of the Tokaido Shinkansen Line in 1964) and eco-friendliness (the railway CO₂ emissions per unit of energy (g-CO₂/passenger-kilometer) being one fifth of aircraft and one eighth of automobiles). As New Shinkansen ^{Note}, Tohoku Shinkansen (between Hachinohe and Shin-Aomori) opened in December 2010 and the Kagoshima Route (between Hakata and Shin-Yatsushiro) of Kyushu Shinkansen opened in March 2011, and Hokuriku Shinkansen (between Nagano and Kanazawa) in March 2015 and Hokkaido Shinkansen (between Shin-Aomori and Shin-Hakodate Hokuto) in March 2016.

For those sections of the Shinkansen whose construction started in June 2012 (between Shin-Hakodate Hokuto and Sapporo on the Hokkaido Shinkansen line, between Kanazawa and Tsuruga on the Hokuriku Shinkansen line and between Takeo Spa and Nagasaki on the Kyushu Shinkansen line), their opening schedules have been accelerated in accordance with “Handling of New Shinkansen Lines” (agreed upon between the government and the ruling party on January 14, 2015). More specifically, the Hokkaido Shinkansen line (between Shin-Hakodate Hokuto and Sapporo) is scheduled to complete and open at the end of FY 2030 five years ahead of the end of FY 2035 as originally scheduled, the Hokuriku Shinkansen line (between Kanazawa and Turuga) at the end of FY 2022 three years ahead of the end of FY 2025 as originally scheduled. In the meantime, the completion and opening schedules of the Kyushu Shinkansen line (between Takeo Spa and Nagasaki) will be moved up from FY 2022 to the extent possible as works are underway at a steady pace.

The Transport Policy Council, which had debated Chuo Shinkansen since March 2010, came up with recommendations in May 2011 to affirm the appropriateness of Central Japan Railway Company as an entity of its operation and construction, the superconducting maglev method of train operation and the Southern Alps of Japan route. The MLIT responded to name Central Japan Railway Company as an entity of operation and construction for Chuo Shinkansen in accordance with the Nationwide Shinkansen Railway Development Act, and decided on the Development Plan and directed Central Japan Railway Company to embark on construction. Central Japan Railway Company, which expects to open its Shinkansen routes between Tokyo and Nagoya in 2027 and between Nagoya and Osaka in 2045, publicized and made available for public inspection an environmental assessment report edited and finalized under the he Environmental Impact Assessment Act in August 2014 and, at the same time, filed an application for Plan for Constructing the Chuo Shinkansen Line Section between Shinagawa and Nagoya Stations (No. 1) to the MLIT, which was approved by the Minister of Land, Infrastructure, Transport and Tourism in October of the same year. Currently, construction of the Shinagawa Station and of the tunnels of the Southern Alps is ongoing.

Figure II-6-1-6 Present Status of New Shinkansen Development



Running tests for superconducting maglev trains had been carried out on the Yamanashi Test Line since 1997. The

(2) Driving technical development

(i) Superconducting maglev trains

Running tests for superconducting maglev trains had been carried out on the Yamanashi Test Line since 1997. The

Note Five routes that are stipulated in the Development Plan approved in 1973 pursuant to the Nationwide Shinkansen Railway Development Act.

Superconducting Magnetic Levitation Technological Practicality Evaluation Committee that met in July 2009 concluded that the “development of the technologies prerequisite to driving superconducting maglev trains to the stage of practical usefulness, including their operation as super-fast mass transit system, are in sight.” Since August 2013, a running test has been in progress on the entire Yamanashi Maglev Test Line to make a final verification of the practical specifications of the cars, propulsion coils and more.

(ii) Free Gauge trains

Technological development of free gauge trains capable of through operation from Shinkansen railway line to conventional railway line and vice versa is underway for completion scheduled for service on Kyushu Shinkansen and Hokuriku Shinkansen. Building on the efforts made in FY 2015, we will continue carrying out technological development for contributing to the durability of gauge change trains toward their introduction to the Kyushu Shinkansen (Nagasaki route). In addition, we will drive forward technological development activity meant to address snow hazards (snow and cold resistance) for running on the Hokuriku Shinkansen.

3 Constructing aviation networks

The Basic Policy Committee, Aviation Group, Transport Policy Council had explored the future directions of Japan’s aviation in recurring sessions of discussions since October 2012 and finally came up with a report in June 2014. The report sets forth mid- and long-term directions in the three areas of aviation: laying a firm ground for building an aviation network, building an enhanced aviation network and developing aviation demand, and providing quality aviation and airport services.

(1) Expanding aviation networks

(i) Enhancing metropolitan airports functionalities

To beef up Japan’s competitiveness in the global arenas of business and tourism, enhancements to the functions of the metropolitan airports were made, thereby achieving the annual total number of arrival and departure slots at Tokyo International Airport and Narita International Airport of 750,000 in March 2015.

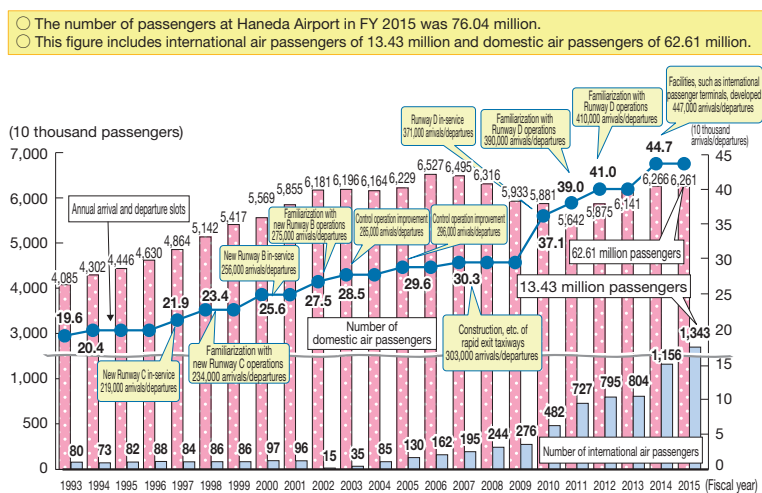
Additions to the international air passenger terminal building at Tokyo International Airport (Haneda) elevated the number of boarding/alighting slots on the international lines by 30,000 to 450,000 a year from March 2014. We will continue developing functions such as tunnels that connect domestic and international flights and parking areas, aiming to enhance airport functions further.

Figure II-6-1-7 Overview of Tokyo International Airport



(Source) MLIT

Figure II-6-1-8 Trend in Number of Passengers and Number of Arrivals and Departures at Tokyo International Airport



Narita international Airport realized 300 thousand arrival and departure slots a year in March 2015 thanks to the development, etc. of an LCC terminal. Efforts will continue to consolidate its position as a hub airport in Asia by making further enhancements to the network of international and domestic airlines, including LCCs.

Having achieved the number 750,000, in view of smoothly holding 2020 Tokyo Olympic and Paralympic Games and looking further ahead, we are working to expand airport capacities of both Haneda and Narita Airports by 2020 to create stronger metropolitan airport functionalities to increase international competitiveness of the area, receive the increasing number of inbound foreign tourists and revitalize local communities.

Specifically, a council composed of representatives of the local public entities concerned, airlines and the like was set up in August of the same year to develop specific measures to enhance the functionalities, such as revision of flight routes at Haneda Airport, and the discussions are ongoing.

Especially, for Haneda Airport, briefing sessions were held to gain broad understanding of residents. Going forward, we expect to develop measures that pay attention to environmental and other impacts by summer 2016, also taking into consideration the opinions received.

With regards to initiatives after 2020, we are working with relevant municipalities to examine specific measures to enhance functionalities, including drastic expansion of capacities of Narita Airport.

(ii) Driving the Open Skies strategically

The Ministry has strategically pursued the Open Skies ^{Note 1}, including metropolitan airports, to respond to changes in the competitive climate resulting from global trends towards air services liberalization while accommodating vigorous economic leaps in Asian and other overseas nations. Open Skies with a total of 27 nations and regions ^{Note 2} were realized by March 2016. Also, discussions with ASEAN are ongoing with a view to concluding an air service agreement between Japan and ASEAN.

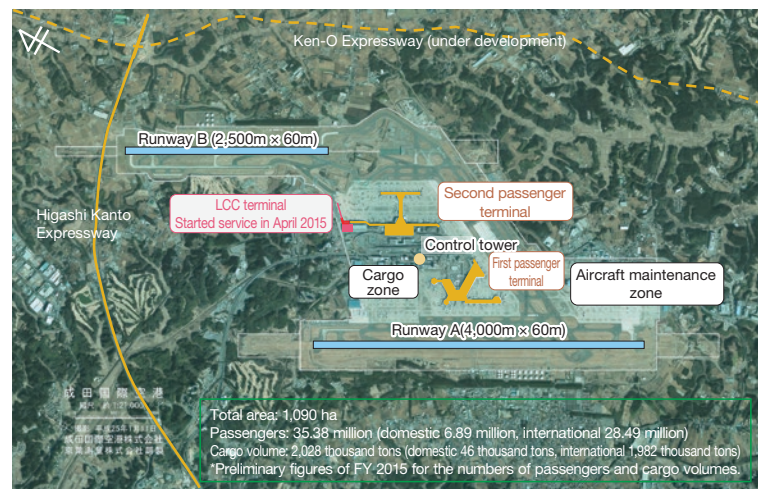
Regarding the second increase in the number of arrival and departure slots at Haneda Airport ^{Note 3}, in February 2016,

Note 1 An agreement on mutually removing bilateral constraints on the number of operators, that of routes and that of flights in international air transportation to enhance the quality of services, such as cutting airfares by encouraging the entry of new airlines, increasing the number of flights and stimulating competition between airlines. In recent years, many countries in the world pursue its implementation.

Note 2 The number of passengers flying to and from the 27 nations and regions accounts for about 94% of the total number of passengers departing from and arriving at Japan.

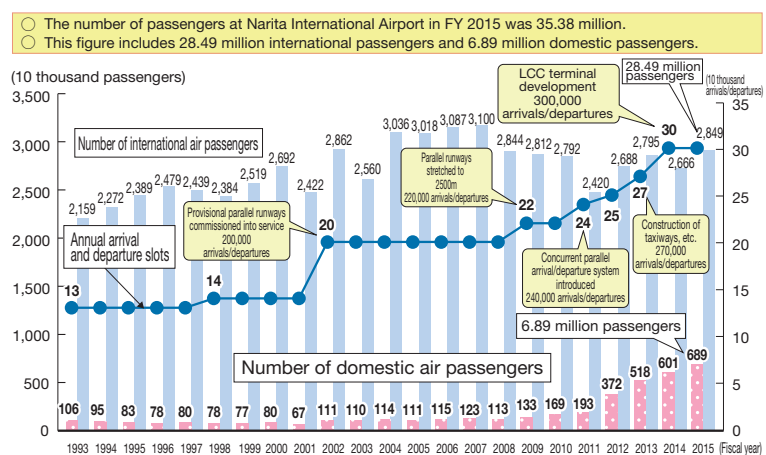
Note 3 From March 2014, the number of arrival and departure slots during the daytime was increased from annual 30,000 slots (40 flights per day) to annual 60,000 slots (80 flights per day).

Figure II-6-1-9 Overview of Narita International Airport



(Source) MLIT

Figure II-6-1-10 Trend in Number of Passengers and Number of Arrivals and Departures at Narita International Airport



(Source) MLIT

Japan and the United States reached an agreement on a framework that enables Japanese and US airlines to operate five flights during the daytime and one flight during the nighttime per day both ways, aiming to start the flight operation on the end of October 2016.

(iii) Realizing concessions related to Kansai International Airport and Osaka International Airport

On July 2012, Kansai International Airport and Osaka International Airport merged into New Kansai International Airport Co., Ltd. with a view to rejuvenating and reinforcing Kansai International Airport as an international core airport and expanding the demand for air transportation in the Kansai district through appropriate and effective utilization of the two airports. The New Kansai International Airport Co., Ltd., is now operating in an integrated manner.

This company has moved ahead with positive measures, such as expanding passenger networks, including LCCs, and turning into a cargo hub airport, in its bid to increase business values of both airports. Also, since the formulation and publication of The Implementation Policy based on the “PFI Act” on July 25, 2014, the company proceeded with concession procedures targeting transfer of business in FY 2015, selected the ORIX-VINCI Airports Consortium as the Preferred Negotiation Right Holder on November 10, 2015, and executed the Project Agreement with an SPC established by the Consortium (Kansai Airports) on December 15, 2015.

(iv) Present status of airport development

For further revitalization of Okinawa at Naha Airport, which plays critical roles as a travel and logistics base connecting Okinawa and mainland Japan/overseas, the project to increase runways was carried out in FY 2015. At Fukuoka Airport, the implementation of environmental assessment procedures on the construction of the new runway continued with the aim of fundamentally resolving the issue of chronic airport congestion at peak times, and a new runway construction project started. Also, the MLIT has been implementing countermeasures against aging airport facilities based on strategic maintenance to ensure safe flights of airplanes, while pushing forward with quake-resistant technologies and structures at airports so that airports can maintain their operations in the event of an earthquake. Furthermore, it has been promoting relocations or changes to the internal layout of the airport terminal area in order to enhance Japan’s international competitiveness and regional competitiveness in the hinterlands of the airports.

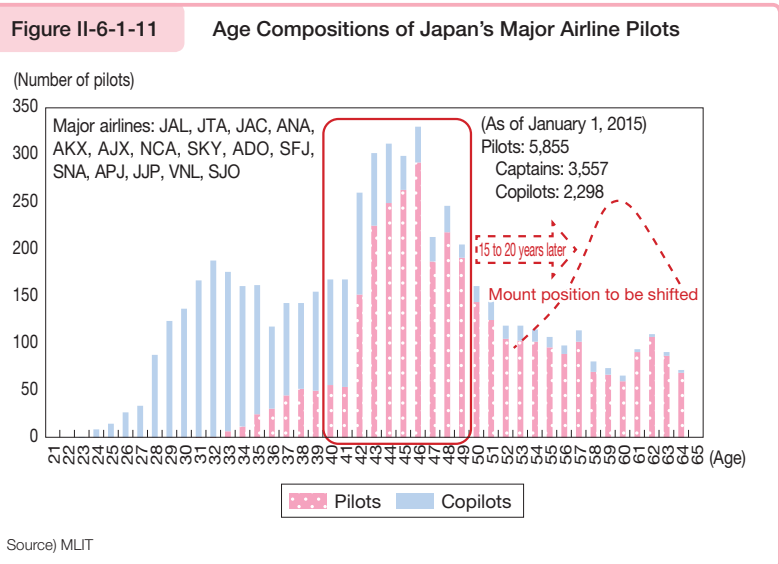
(v) Fostering and securing aircraft pilots, etc.

In the Japanese aviation industry, while drastic leaps in the demand for aviation focusing on international lines and massive retirement of pilots in their 40s, who form a primary workforce at present, are predicted in the future, it would be difficult to fully fill the future demand for pilots with the present yearly supply of new pilots. Hence, a solution to middle- and long-term shortages of pilots is sought.

To this end, the Joint Subcommittee for Studying Crew Policies was formed under the Basic Policy Taskforce and Technology and Safety Taskforce, Aviation Group, Transport Policy Council in December 2013 to explore directions in the specific

measures to address shortages of pilots, and a report was put together in July 2014. Subsequently, the following initiatives have been taken in accordance with the report. The Aircraft Pilot Training Liaison Conference consisting of relevant stakeholders including airlines and training organizations was launched in August 2014, and various challenges in training and securing pilots are being examined utilizing such a conference.

In order to secure pilots ready for work, we are promoting such efforts as using Self-Defense Force pilots or foreign pilots by relaxing residency status requirements or hiring active pilots under enhanced health management by raising the



age limit for airline pilots.

Also, a unified website Skyworks (<http://www.skyworks.info>) that shows the appeal of aviation related jobs was launched in December 2015 while we promote efforts in such areas as efficient pilot training by airlines, expanding the supply capacity of private sector training institutions including private universities, and further utilization of Civil Aviation College.

Furthermore, under increasing demand for pilots for ambulance, firefighting, and disaster prevention helicopters and other helicopters of highly public nature, securing helicopter pilots is an important issue. Therefore, a liaison meeting of relevant ministries was set up to discuss ideal ways of training and securing helicopter pilots, which was put together in July 2015. Based on this, the Helicopter Taskforce set up under the Aircraft Pilot Training Liaison Conference is examining specific measures including development of training programs for ambulance and other helicopter pilots with private-public sector collaboration.

(2) Enhancement and optimization of airport operations

(i) Driving airport management reforms

Using the Act on Operation of National Airports Utilizing Skills of the Private Sector (Private Utilizing Airport Operation Act), the MLIT is committed to driving airport management reforms at national airports and the like to suit specific local conditions through utilization of private-sector capabilities, integrated management of airline and non-airline businesses and so on in order to expand the amount of population who are engaging in domestic and international interactions, etc. on the support of the airports and thus to encourage regional revitalization.

An implementation agreement with the holder of the right to operate public facilities was concluded in December 2015 for Sendai Airport, the first project for government-managed airports, and preparation is ongoing toward the start of operation in July 2016.

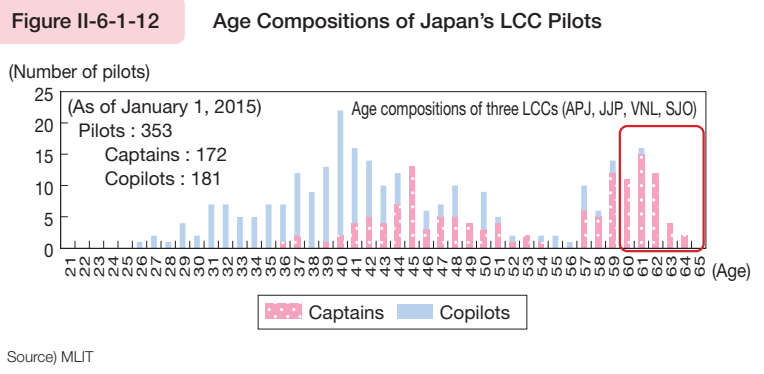
(ii) Encouraging LCC entry

An LCC originating from Japan went into service in March 2012. As of March 2016, Peach Aviation operated 14 domestic routes and ten international routes; JetStar Japan, 16 domestic routes and six international routes; Vanilla Air, three domestic routes and three international routes; and Spring Airlines, two domestic routes and two international routes. Also, AirAsia Japan is expected to start LCC flight operations (re-entry in the market by AirAsia group) in 2016.

The accelerating entry of LCCs could create new demand for aviation by attracting more tourists visiting Japan, expanding domestic tourism and so on. Government-set goals dictate that “domestic LCC passengers account for 14% of the total number of airline passengers in 2020, with international LCC passengers accounting for 17%.” Various measures have been taken by the government and at the individual airports to encourage the entry of LCCs.

Two principal governmental measures being implemented or explored are summarized below. The first measure was the abatement of the landing fees during FY 2013 with regard to the equipment (100 tons or less) mainly used by LCCs with an aim to revitalize local communities by maintaining local routes and supporting LCCs, and this measure was taken during FY 2015 as well. The second is the promotion of airport management reforms. Many of Japan’s airports are managed by the central and local governments, contemplating to keep their runways and airport buildings under integrated management and launching strategic airfare plans and sales campaigns in conjunction with private businesses in a bid to attract LCCs.






In addition to these measures, each individual airport has also taken two key steps to create an environment for hosting LCCs. One is the construction of LCC dedicated terminals. FY 2012 witnessed the launch of an interim LCC receiving facility at Narita International Airport, Japan’s first LCC dedicated terminal (T2) at Kansai International Airport and an interim LCC terminal leveraging existing facilities at Naha Airport. Furthermore, Terminal 3 (LCC terminal) at Narita International Airport came into service in April 2015. In addition, the construction of LCC terminals is being contemplated



for Kansai International Airport for commencing services by the end of FY 2016. The feasibility of constructing new LCC terminal is being explored at Chubu International Airport as well. The second is the reduction of the airport fees, including landing fees. Efforts that began in FY 2014 continued into FY 2015 to mark down or review the airport fees, including landing fees at Narita International Airport and Kansai International Airport.

Figure II-6-1-13 Overview of Japan's LCC Projects

○ Since 2012, LCCs entered into the business also in Japan.
○ In FY 2014, LCCs accounted for 8.2% of domestic flight passengers. March 27, 2016

Company name	Peach Aviation, Ltd.	Vanilla Air Inc.	Jetstar Japan Co., Ltd.	Spring Airlines Japan Co., Ltd.	AirAsia Japan
Major shareholders	- ANA Holdings 38.7% - First Eastern Aviation Holding Limited 33.3% - Innovation Network Corporation of Japan 28.0%	- ANA Holdings 100%	- Qantas Group 33.3% - JAL 33.3% - Mitsubishi Corp. 16.7% - Century Tokyo Leasing Corp. 16.7% <small>*The ratios are based on the voting rights.</small>	- Spring Airlines Company Limited 33.0% and others	- AirAsia Investment 33.0% - Rakuten, Inc. 18.0% - Noevir Holdings Co., Ltd. 18.0% - Alpen Co., Ltd. 18.0% - FinTech Global Trading Incorporated 13.0% and others <small>*The ratios are based on the voting rights.</small>
Core airport	Kansai International Airport Naha Airport, Narita International Airport	Narita International Airport	Narita International Airport Kansai International Airport	Narita International Airport	Chubu International Airport
Equipment used	Airbus Model A320 (180 seats)	Airbus Model A320 (180 seats)	Airbus Model A320 (180 seats)	Boeing 737 (189 seats)	Airbus Model A320 (180 seats)
In service from	March 1, 2012	December 20, 2013	July 3, 2012	August 1, 2014	Summer 2016 (planned)
Service route	(Domestic flight) Kansai-Sapporo, Sendai, Narita, Matsuyama, Fukuoka, Nagasaki, Kagoshima, Naha, New Ishigaki, Miyazaki Naha-Fukuoka, Narita Narita-Sapporo, Fukuoka Total 14 routes (International flights) Hanoi-Taoyuan Incheon February 5, 2016 Kansai-Incheon, Busan, Taoyuan, Kaohsiung, Hong Kong Naha-Taoyuan, Hong Kong, Incheon Total 10 routes	(Domestic flight) Narita-Sapporo, Amami, Naha Total 3 routes (International flights) Narita-Taoyuan, Hong Kong, Kaohsiung Kansai-Taoyuan (April 27, 2016) Total 3 routes	(Domestic flight) Narita-Sapporo, Kansai, Takamatsu, Matsuyama, Fukuoka, Oita, Kumamoto, Kagoshima, Naha Kansai-Sapporo, Fukuoka, Naha Chubu-Sapporo, Fukuoka, Kagoshima, Naha Total 16 routes (International flights) Narita-Hong Kong, Taoyuan, Manila Kansai-Hong Kong, Taoyuan, Manila (April 7, 2016) Chubu-Taoyuan, Manila (April 1, 2016) Total 6 routes	(Domestic flight) Narita-Hiroshima, Saga Total 2 routes (International flights) Narita-Wuhan, Chongqing Total 2 routes	(Domestic flight) Chubu-Sapporo, Sendai (planned) (International flights) Chubu-Taipei (planned)
Characteristics of corporate structure	Business operation independent of ANA 	A consolidated subsidiary of ANA. Business operations are coordinated with ANA. 	Business operation independent of JAL. 	Business operations leveraging the Spring Airlines' network (China) 	Reentry by AirAsia group 

Source) MLIT

(iii) Accelerating the reception of business jets

A business jet is a small aircraft with the capacity to hold a few to more than a dozen passengers at the most. Business jets are typically used by businesspersons valuing time because they are able to adjust times according to their schedules or utilize the plane as a secure space to carry on business meetings and such on board. Business jets have become a means of global corporate activity in the U.S. and Europe. As Japan's economy goes on global, the need to attract investment from overseas is beginning to win wider recognition than before, instead of conducting a one-sided exchanges, such as building a plant overseas. Hence, the importance and potentials of business jets in Japan will grow from a viewpoint of consolidating economic growths in the Asian regions from now on.

Structural measures have been implemented and regulations eased to get better prepared for hosting business jets flying into metropolitan airports. For example, the monthly application deadline and finalization date for flight schedules at Tokyo International Airport were advanced (by five days) starting from flights for the end of March 2016; fast lanes available to inbound foreign visitors using business jets were established at Kansai International Airport; and spots available to getting on and off business jets were increased (by two spots) at Narita International Airport.

Going forward, measures including active information dissemination and relaxation of regulations on business jets will be examined for embedding the use of business jets.

(iv) Promotion of international flight services at regional airports

Although the number of foreigners visiting Japan is steadily increasing, about 70% concentrates on the sightseeing route called the Golden Course that connects the Tokyo metropolitan area and the Kansai region. Going forward, the key challenge in receiving more travelers is to attract foreign travelers directly to various regions in Japan to create inbound and outbound flows of travelers in rural areas, in addition to enhancing metropolitan airports functionalities.

For airports managed by the national government, landing fees of international flights have already been reduced by 30% for regular flights and by half for charter flights. In addition, reductions of landing fees for international flights will be newly introduced at regional airports in FY 2016 with the aim of increasing inbound foreign tourists. Landing fees will be reduced by half at airports managed by the national government, excluding Tokyo International Airport, New Chitose Airport, and Fukuoka Airport for new or additional international passenger flights in coordination with regional efforts to attract flight routes. This will encourage international flight services at airports in regions that are positive about improving the environment to welcome foreign travelers, such as by facilitating the formation of wide-area tourism routes.

(3) Constructing air traffic system

(i) Building a new air traffic systems

In FY2010, air traffic experts from the industrial, academic and governmental sectors formulated a long-term vision for future air traffic systems as CARATS (Collaborative Actions for Renovation of Air Traffic Systems) with a view to realizing a globally interoperable air traffic system and addressing increases in long-term demand for air traffic capacity and diversified needs. Studies are underway to make this vision a reality in conjunction with ICAO's Global Air Navigation Plan (GANP).

In FY 2015, we began examining ways to realize flights where airplanes fly upwards continuously without temporary leveling off from takeoff to cruising in order to reduce fuel expenses and CO₂ emissions through more efficient flights. Also, with the aim of realizing the use of precision landing, which is currently limited to straight lines, we are examining the introduction of the Ground Based Augmentation System (GBAS) to allow for curved lines to improve safety and convenience. Furthermore, discussions on new networks for globally sharing aviation information are also ongoing.

(ii) Pursuing enhancing metropolitan airport capacities

As continual effort directed at expanding the capacities of the metropolitan airports and airspaces, a yearly arrival/departure capacity of 447 thousand times was achieved at Tokyo International Airport (Haneda) in March 2014. At Narita International Airport as well, simultaneous parallel departure procedure has been introduced since October 2011 to enhance annual capacity without expanding noise-impacted zone and achieved a yearly capacity of 300,000 arrivals/departures in March, 2015 with the two runways currently in service by the familiarization with this method of aircraft operation and deployment of equipment which can monitor aircraft with high precision.

Specific studies will proceed to pursue further functional enhancements to the metropolitan airports.

(4) Strategic promotion of international aviation measures

The Asia and Pacific region is considered to grow into the world's largest aviation market before too long. In the circumstances, what is of strategic importance to Japan is not only to contribute to strengthening of the aviation networks in this region but also to actively capture the impetus of the emerging countries in which numerous aviation projects are in progress.

Because unified public and private approaches are essential to winning orders, efforts have been made to collect information and consolidate bilateral ties at the primary initiative of the Council for International Deployment of Aviation Infrastructure.

Activities in FY 2015 included inviting key governmental officials of Mongolia (June 2015) and holding an aviation seminar in Vietnam (December 2015).

4 Facilitating traffic access to airports

With respect to improving traffic access to metropolitan airports, the Council of Transport Policy, which reviews approaches to future urban railways in the Tokyo Area, is examining such improvements. Studies towards the construction of the direct line to city center are also ongoing.

Section 2 Implementing Comprehensive and Integrated Logistics Policies

In accordance with the Comprehensive Logistic Policy Guidelines (2013-2017), logistics policies are implemented in a comprehensive and integrated manner in coordination between the public and private sectors.

1 Implementing logistic policies to correspond with deepening global supply chains

To keep up with deepening global supply chains, efforts directed at reinforcing Japan's international logistic facilities are under way, including driving overseas deployment of the nation's logistic systems.

(1) Promoting overseas deployment of Japan's logistics systems

As supply chains continue to get globalized at a deeper level than ever, grabbing the evolving Asian markets would be essential to sustaining and enhancing the international competitiveness of Japan's industries. The formation of a sophisticated international logistics system should be of prerequisite importance to meet this urge. Capturing the Asian markets has become an urgent task for Japanese logistics companies that support the business expansion of the nation's industries in Asia.

However, the existence of institutional and customary constraints in the partner countries is posing challenges to Japan in expanding its high-quality logistics systems into Asian nations. Therefore, the MLIT is developing an environment to encourage overseas expansion of Japan's logistics systems through logistics pilot projects, dialogs between governments, development of human resource projects, and other means in collaboration between the public and private sectors.

(2) Strengthening the functioning of the international marine transportation network

As the globalization of economy progresses, the volume of international marine transportation continues to grow year to year. From the perspective of optimizing marine transportation through large bundle shipments, container carriers and bulkers continue to grow in size. In the meantime, key Asian ports have successfully increased their volumes of freight handling, resulting in concentrated ports of call, international trunk routes making fewer calls at Japan. Furthermore, slow responses to larger vessels to carry bulk cargo ^{Note} raise concerns over diminishing competitiveness in domestic industries forced into a mutually disadvantageous business environment.

In light of such conditions, Japan carries on its effort to streamline the flow of logistics that supports economic activity in Japan and life of citizens, improving the shipping entities at their location at home, which would in turn augment Japan's industrial competitiveness and realize economic reconstruction by maintaining and expanding the calls of international trunk routes at Japanese ports and simplifying and stabilizing imports of lifeblood materials, such as resources and energies.

In parallel with these approaches, efforts to shape an efficient network of marine transportation in which international and domestic transport services are integrated will be carried on, and relevant measures will be enhanced and developed at a deeper level of refinement.

(i) Enhancing the facilities of strategic international container ports

To strengthen Japanese economy's international competitiveness and to maintain and create citizens' employment, the international trunk routes of marine container transportation that link Japan to North America, Europe, and other places need to be consistently maintained and even expanded.

Note A generic term covering cargoes that ship in bulk, such as grains, iron ores, coal, oils and timber.

To address this need, Hanshin Port and Keihin Port were selected to be an International Container Hubs each in August 2010 to implement a fully package of structural and non-structural measures, including the construction of deepwater quays and efficient port management. Under the circumstances where ports of call for international trunk routes had been narrowing down because ships were becoming larger and collaboration between shipping companies progressing, the International Container Hubs Policy Promotion Committee released its final conclusions in January 2014 focusing on the three key principles of “Collecting Cargo,” as by picking up cargoes at international container hub from sources over a broad area, “Creating Cargo,” as by integrating industries in the hinterlands of strategic ports, and “Strengthening International Competitiveness” as by reinforcing the functionalities of deepwater container terminals or creating a government system of investment into port management companies.

At Hanshin Port, support at national expense is provided to cargo collection business conducted by Kobe-Osaka International Port Corporation, in which the national government made an investment. The number of domestic feeder route services at ports in West Japan increased about 40% from 68 calls per week to 95 calls per week, and about 140,000 TEU of cargos were collected at Hanshin Port in FY 2015. These efforts are starting to yield fruit with the number of container cargos handled at Kobe Port in 2015 recorded a record high since the Great Hanshin-Awaji Earthquake in 1995.

For Keihin Port, an 18 meter-deep container terminal, the deepest in Japan, started services at Minami-Honmoku Pier, Yokohama Port on April 2015. Also, Yokohama Kawasaki International Port Co., Ltd., which was established at Yokohama Port and Kawasaki Port in advance, was designated as port operate company in March 2016, and the national government has made an investment in this company, thereby establishing a framework for collaboration among the government, port authority and the private sector.

From now on, the International Container Hubs Policy will be deepen and also initiatives be accelerated.

(ii) Forming a marine transportation network for moving resources, energy sources and so on with stability and efficiency

Supply-demand balances for resources, energy, and so on, assuring Japan of stable, low-cost imports of these substances to build up industrial competitiveness of the nation’s industries and to maintain and even create employment and revenues should be one of the tasks of foremost importance as the nation depends on imports for virtually 100% of its requirements.

The MLIT seeks to build stable and efficient networks of marine transportation for resources, energies and so on by developing large ship-ready port and harbor facilities as key locations, promoting inter-business partnership and so on. On December 2013, the amended Port and Harbor Act came into effect to this end, along with associated cabinet orders and ministerial ordinances. The Act authorizes the Minister of Land, Infrastructure, Transport and Tourism to name designated cargo import ports as import sites for bulk cargoes, such as coals, and also stipulates measures in support of such ports. Currently, initiatives are undertaken at Onahama Port and Kushiro Port, which are designated as strategic international bulk ports. At Onahama Port, construction of an 18 meter-deep international logistics terminal started in FY 2013 as a base for handling coal imports, and it was designated as Specified Cargo Import Hub Port in December 2013; Fukushima, the port administrator, developed and published a plan for promoting specified use with the aim of driving joint sea transport of coal. At Kushiro Port, construction of a 14 meter-deep international logistics terminal started in FY 2014 as a base for handling grain imports, and it was designated as Specified Cargo Import Hub Port in February 2016.

The goal is to realize a stable, low-cost supply of imports and thus build up Japan’s industrial competitiveness, create more employment and prevent outflow of earnings abroad.

(iii) Building functionally core ports on the Japan Sea

Among the ports located on the coastal line of the Japan Sea geographically close to the fast economically growing nations across the sea, core ports were selected in November 2011 in an effort to capture the economic booms in these nations into Japan’s growth through selection of functions and concentration of measures and through port-to-port linkage and to build a disaster-resistant logistics network following the Great East Japan Earthquake. We will continue to follow up on the progress and other aspects of the plans formulated by port management bodies.

(iv) Building an integrated logistics information platform

An integrated logistics information platform that combines Nippon Automated Cargo Consolidated System (NACCS), with Container Logistics Information Service (Colins) is being built in order to improve the efficiency of system

administration and user convenience.

(v) Enhancing functionalities of international ports

The MLIT not only develops international physical distribution terminals, etc. in the international maritime transport network or at regional hub ports for consolidated competitiveness, etc. of local key industries but also pushes efforts directed at enhancing the functionalities of these ports, as by pushing their migration to ICT. To address increasingly sophisticated and diversified needs for East Asian logistics, which is not much different from domestic logistics in both terms of time and distance and build a low-cost logistics system, the Ministry pushes ahead with functional enhancements to unit loading terminals ^{Note} and with the construction of facilities designed to smooth the flow of cargo transshipment.

(vi) Developing a marine transportation environment

Among all international backbone routes, those that could interfere with bay navigation because of shallow waters, etc. have been improved and Aids to Navigation have been established to develop a marine transportation environment that combines the safety of navigation with the efficiency of marine transportation.

Also, with the aim of evacuating ships promptly and smoothly to safe sea areas at times of tsunami and other disasters and mitigating congestion in peacetime to realize safe and efficient operation of ships, the Japan Coast Guard is working to consolidate the Tokyo Bay Vessel Traffic Service center and port traffic control offices and develop a system for implementing these operations in an integrated manner. In conjunction with the operation, we are working on necessary revisions of systems to maintain maritime traffic functions at times of disasters.

(3) Developing advanced aviation logistics facilities to pursue increased international competitiveness

The MLIT pushes efforts to consolidate the functionalities of the metropolitan airports, drive an airfreight hub implementation of Japan's hub airports, such as Kansai International Airport and Chubu International Airport, and simplify the transportation process flow in its bid to positively capture airfreight originating from and arriving in Asia as it promises further leaps.

(4) Improving logistics for promoting exports of agricultural and marine products and food products

The exports of agricultural and marine products and food products reached 745.2 billion yen in FY 2015, reviewing the record high for two consecutive years. Given that keeping the quality and enhancing cost competitiveness of agricultural and marine products and food products are key to expand their exports. Furthermore, we are pushing forward efforts to increasing the sophistication and efficiency of logistics, such as spreading and promoting technologies and devices for preventing those products from perishing during transportation and keep them fresh and expanding transportation of large-volume shipments by combining different items of cargos.

(5) Strategic development and utilization of a logistically important road network

Building an efficient logistics network is of crucial importance to motor-truck transportation, which accounts for about 80% of domestic transportation. Because of this, the construction of ring roads in the three major metropolitan areas, access roads to airports and ports is underway. In October 2014, "road network for vehicles exceeding the weight and size limits" were separately designated among these roads to simplify the procedural routine for issuing passage permits for those large-sized vehicles using roads in these sections. This is aimed at sectional enhancement by designation of last-one-mile sections to logistics bases and systematic elimination of impassable sections. In addition, we are steadily pushing forward with "smart logistics management" utilizing information technology, such as simplification of the special vehicle passage permit for vehicles with ETC 2.0 and demonstration experiment of operation management support services for ETC 2.0 vehicles. Efforts are also underway to utilize and upgrade existing road networks, including the construction of smart ICs.

Note A unit loading terminal is a terminal ready for the scheme of transportation in which freights are loaded and unloaded, unitized, in chasses, containers or the like, to make their physical distribution faster and more efficient.

(6) Measures that help consolidate international logistics facilities

To meet the needs for the improved logistics network where international freight transport is efficiently combined with the domestic transport including all modes of land, sea and air, we are driving forward the realization of the interoperation of chasses (trailers that have no power drive) to and from Korea and China.

Also, we will promote standardization of Japan's logistics systems to be used internationally, thereby contributing to improved logistics environments in Asian distribution networks and strengthening international competitiveness of Japanese logistics companies, based on the services and knowhow that domestic logistics companies have, which is at the world's highest level, including cold chain and delivery services.

The MLIT will push the development and redevelopment of physical distribution sites and facilities around international ports, etc., which are nodal areas for international physical distribution in metropolitan zones. They will also undertake this at the ports that are the strongpoints of physical distribution and industry. This will be done to build up international competitiveness and form an efficient network of physical distribution as an integral part of urban environment improvement activity, while also seeking better disaster preparedness to deal with massive disasters as they occur.

2 Measures aimed at building an efficient and sustainable logistics system in Japan

Additional approaches are underway to build an efficient and sustainable logistics system at home to toughen Japan's industrial competitiveness and increase logistics productivity while easing environmental loads.

(1) Flow of interregional logistics

The MLIT proceeds to develop nodal points of logistics, such as ports and freight stations, to drive combined multimodal transportation. Cargo transportation by rail can be used more efficiently by utilizing the facilities that have been developed to increase capacities of cargo transportation by rail. The construction of combined multimodal transport terminals is also being proceeded at Toyo Port and elsewhere to consolidate coordination between marine transportation and other modes of transport. Furthermore, in June 2015, we compiled a report on various issues concerning alternative transportation at times of railway transportation disruptions. Also, since FY 2015, we have been working on the development of low floor type railroad cars that meet the height restrictions of existing structures such as tunnels with the aim of promoting modal shift of 40 feet container to railway transportation in domestic transportation of import/export container cargos.

Key road networks will also be constructed to streamline the flow of truck transportation.

(2) Optimizing local logistics in cities, depopulated and other areas

Urban distribution centers ^{Note} have been developed in 20 cities and 29 locations (27 of which were already in service by the end of March 2016), in accordance with the Act on the Improvement of Urban Distribution Centers, to enhance the urban functions of logistics and streamline road traffic through the intensive location of distribution facilities.

To prevent roadside parking for cargo handling purposes, the Ministry has encouraged local governments to include the mandatory installation of parking spaces for cargo handling in their municipal parking ordinances. As of the end of March 2015, municipal ordinances that stipulate mandatory installation of parking spaces for cargo handling at commercial facilities of above certain size were established in 89 cities.

Measures taken to optimize traffic flow include making focused attempts at eliminating congestion bottleneck points, constructing graded intersections, and resolving railway crossings that are closed at nearly all times. In parallel, non-structural measures, such as those aimed at encouraging joint transportation and delivery pursuant to the Low Carbon City Promotion Act to boost loading efficiency, have been promoted.

Furthermore, while the number of people having difficulty in daily shopping is increasing in depopulated and other areas, the logistics efficiency is on the decline. Therefore, based on the report compiled by "review meeting on sustainable logistics networks that support local communities" at the end of FY 2014, we implemented model projects in five regions across Japan and examined operational issues and countermeasures to accumulate and spread practical expertise.

Note A large-scale urban distribution center intensively equipped with distribution facilities, such as truck terminals and warehouses, which is conveniently located for ready access to an expressway interchange, for example.

Starting from June 2015, we held the “review meeting on promoting diversification of delivery receipt methods to reduce redeliveries” consisting of delivery business operators, mail order business operators and the like to understand the current status and analyze causes with the aim of reducing avoidable redeliveries, and compiled a report on tasks to be addressed and direction of countermeasures in September of the same year.

The development of technologies and businesses for unmanned aerial vehicles, or drones, is rapidly progressing, and there is a possibility of using them in the area of logistics to transport goods in depopulated areas and cities and in emergencies such as a disaster. Therefore, on the assumption that flight safety is ensured based on formulation of basic flight rules upon enforcement of the Act to Partially Amend the Civil Aeronautics Act in December 2015, we plan to work toward early realization of drone use in logistics by conducting surveys and identifying issues toward commercialization of drones.

(3) Further efforts to implement logistic services that are more sophisticated, comprehensive, and efficient.

To accelerate the implementation of the 3PL business ^{Note 1} Furthermore, the MLIT not only arranges for the environment in which logistic companies find it easier to make inroads into the 3PL business easier, by participating in human resources development and training sessions, creating guidelines for small and medium business companies to enter the EC market, but also seeks to generalize and simplify the logistic flow through a system of accreditation for total efficiency plans ^{Note 2} in accordance with the Act on Advancement of Integration and streamlining of Distribution Business.

As of the end of March 2016, 289 total efficiency plans were accredited in accordance with the Act. In addition, we compiled “KPI for Logistics Companies ^{Note 3}” in March 2015 with the aim of increasing efficiency in logistics operations through coordinated efforts between logistics companies and shippers.

(4) Measures for labor shortage in logistics sector

Under the influence of falling birthrates with aging populations, concerns over shrinking workforces are looming mainly in the trucking and domestic shipping sectors. Amid these circumstances, in order to secure the human resources needed in logistics and enhance logistics efficiency/labor saving, we are working to further facilitate modal shifts and joint transportation and to reduce redeliveries in order to boost logistics efficiency/labor saving, while striving to promote social significance of logistics business effectively, in accordance with the Action Plans for Measures for Labor Shortage in Logistics Sector (March 2015 by the MLIT).

In addition, the Logistics Taskforce was established under the Subcommittee of Infrastructure Development Council in April 2015, and based on a report compiled in December of the same year at a joint meeting with Basic Policy Taskforce under Road Subcommittee of Infrastructure Development Council, we are working to increase productivity of logistics business, while promoting development of working environments where everyone can work and take active roles regardless of gender and age as well as creation of attractive workplaces where people can keep motivated to work with pride, such as by reducing long work hours and increasing wages.

Note 1 Third-party logistics: an outsourcing service that undertakes a fully integrated flow of physical distribution of cargoes from the cargo owners.

Note 2 A plan that is committed to integrating and expediting physical distribution mainly at a physical facility located in the vicinity of a social infrastructure, such as an expressway interchange or port, as by installing information systems, disaster prevention facilities and the like while seeking concentrate transportation networks and share shipping and delivery operations.

Note 3 KPI is abbreviation for key performance indicators, meaning indicators used for monitoring operational processes for achieving corporate targets.

Column

Measures to reduce redelivery in home delivery services

Recently, the use of home delivery services has sharply increased (15% up over the past five years) because of the massive expansion of electronic commerce, and approximately 20% of packages have been redelivered. A tentative calculation by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) reveals that such redelivery causes significant social losses, such as “approximately 420,000 tons of carbon dioxide emissions per year, which is equivalent to 1% of annual emissions from commercial trucks (also equivalent to annual absorption by a cedar forest 2.5 times the area of the inner Yamanote Line)”, “approximately 180 million labor hours per year (equivalent to manpower of 90,000 people per year)”, etc.

In response to the findings, MLIT has held Review Meetings participated in by relevant enterprises, such as home delivery companies, mail order firms, convenience stores, and locker service companies, and carried out a questionnaire survey about redelivery in home delivery services ^{Note}. According to the results, redelivery was caused because the receivers “didn’t expect the delivery” or “expected, but were not home,” each accounting for about 40% of the causes.

Reduction of social losses inflicted by redelivery will lead to the suppression of global warming and the improvement in shortage of truck drivers due to the declining birthrate and aging population. Also, in order to maintain and make better Japan’s highly convenient delivery services in the future, it is necessary to reduce wasteful redelivery.

To achieve the reduction in redelivery, in addition to further collaboration among relevant enterprises and their finding of better ways, each citizen is required to understand the social losses from the redelivery and offer cooperation.

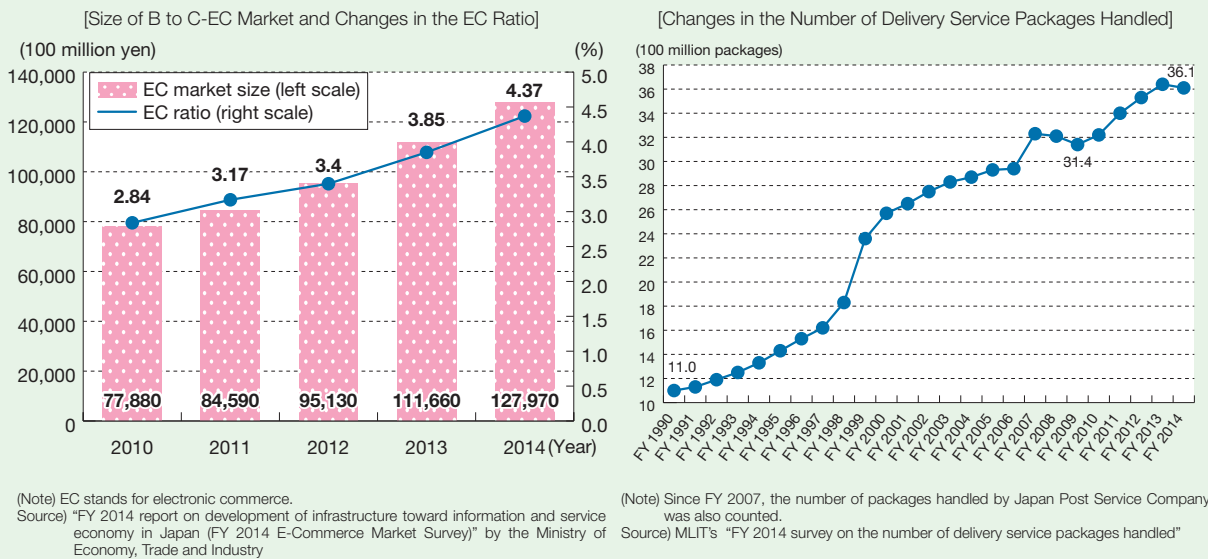
MLIT has summarized main concrete measures to decrease the redelivery, as follows.

<Main concrete measures>

- (i) Introduction of simpler methods to designate delivery date and time by utilizing the Web, applications, etc.
- (ii) Promotion of public understanding of social losses from the redelivery and the grant of benefits to receivers according to their contribution to lower redelivery.
- (iii) Improvement in convenience by expanding home delivery and mail order services handled by convenience stores, offering better procedures for receiving, etc.
- (iv) Promotion of installation of home delivery boxes in houses and rightsizing of packages for the delivery boxes.
- (v) Introduction and expansion of new methods for receiving packages, such as installation of home delivery boxes in railway stations and other public areas.

In order to realize these concrete measures, it is necessary for various relevant enterprises to collaborate and make efforts beyond the existing boundaries. Furthermore, for Japan’s logistics business to raise the productivity and to maintain and improve the services, it is essential that cargo owners and logistics companies address this redelivery issue in an integrated manner, and that enterprises and citizens, the users of the services, understand and cooperate with the logistics business.

Note Questionnaire survey of receivers of redelivery taken by Review Meeting on promotion of diversified methods for receiving packages, etc., toward reduction in the redelivery in home delivery services.



Section 3 Reactivating Industries

1 Trends in railway industries and measures

(1) Railway business

(i) Trends and measures in the railway business

The number of railway passengers carried in FY 2014 increased from its year earlier level. At Japan Railway, transportation on Shinkansen increased while transportation on conventional railway lines decreased, with transportation on private railways on the increase.

In FY 2014, the annual volume (tons) and distance (kilometers) of railway freight were almost flat from the previous fiscal year, while carload freight slightly decreased.

The railway operators are working on such initiatives as presenting guidance information in multiple languages, showing route and station names along with their alphanumeric notation and offering free public wireless services in order to enhance railway competitiveness, increase convenience in coordination with livelihood services and be better prepared in receiving inbound foreign tourists.

Additionally, traffic IC cards continue to gain growing popularity across the nation since their pioneer "Suica" was launched by JR East in 2001. Since March 2013, 10 kinds of traffic IC cards used by JR and major private railways and the like have been made interoperable. As IC cards penetrate more railway operators and areas, they could help improve passenger convenience and reactivate regional economies.

(ii) Initiatives towards the complete privatization of Japan Railways

The individual companies of Japan Railways incorporated upon breakup and privatization of Japan National Railways in April 1987 have carried on their respective management efforts to meet their own regional conditions and management climates over the following nearly 30 years. Meanwhile, East Japan Railway Company, West Japan Railway Company and Central Japan Railway Company have been completely privatized with completion of sales of shares held by the Japan Railway Construction, Transport and Technology Agency.

Hokkaido Railway Company, Shikoku Railway Company, Kyushu Railway Company and Japan Freight Railway Company, on the other hand, carry on their respective efforts to increase revenues and cut costs. In the light of the social significance of the roles these companies play, such as securing means of local transportation and driving railway freight transportation having low environmental loads, necessary aids have been extended to them to reinforce their management structure and thus make them economically viable by leveraging funds from the JR TT Special Services Account since FY 2011 in accordance with the Act on Treatment of Debt, etc. of JNR Settlement Corporation (Act on Treatment of Debt,

etc.), in addition to the fixed property tax breaks already in effect.

Subsequently, as stable management base was established for Kyushu Railway Company with listing conditions in place, complete privatization of it was decided and the Act to Partially Amend the Law concerning Passenger Railway Companies and Japan Freight Railway Company was passed in June 2015 (enforced in April 1, 2016) so that Kyushu Railway Company will be removed from the scope of application of the Law concerning Passenger Railway Companies and Japan Freight Railway Company. For Hokkaido Railway Company and Shikoku Railway Company, in response to announcement by the MLIT Minister in June of the same year, it was decided to take additional support measures to enable implementation of necessary investments in safety and maintenance from FY 2016 under the Debt, etc. Disposal Act.

(2) Railway vehicle industry

The volume of newly built railway vehicles by value moved flatwise for domestic shipment and varied depending on the status of orders for overseas shipment. Production by value in FY 2014 stood at 168.4 billion yen (1,645 vehicles.) Production by value were broken down into 93.1% (156.8 billion yen) for domestic-bound and 6.9% (11.6 billion yen) for export-bound, former rising 1.4% over FY 2013 and the latter decreasing 69.9% over FY 2013.

Production of railway vehicle parts (such as power generators and bogies) was 278.9 billion yen by value and that of signal protection devices (such as automatic train control devices and electrical interlocking devices) was 121.7 billion yen.

Rolling stock builders and others are working to develop rolling stocks that fill diverse social needs, such as speed, safety, passenger comfort, low noise and being barrier-free, by partnering with railway operators and also to set up and even expand local production and service sites in the U.S., U.K. and elsewhere with the recent order taking for overseas projects as an impetus.



2 Trends in motor truck transport business and measures

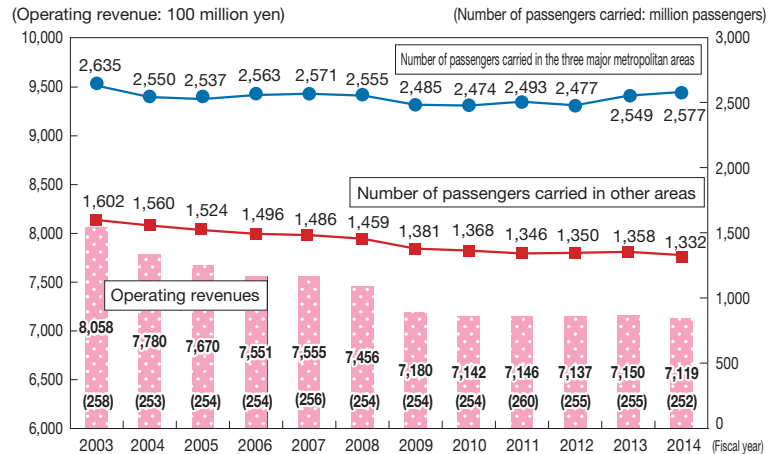
(1) Passenger vehicle transport business

(i) Motor bus business

Demand for motor bus transportation, which is represented by the number of passengers carried and operating revenues, remained on the decline in pace with changes in the urban structure, such as a hollowing of the central area of a city, and increased ownership of private cars with the progress of motorization. While business activity remains sluggish, the climate surrounding the motor bus business remains extremely harsh.

Figure II-6-3-1

Changes in the Number of Passengers Carried by Motor Buses and Operating Revenues



(Notes) 1 Numeric data above has been collected from the bus operators who own a fleet of at least 30 motor buses. The parenthesized value for each fiscal year denotes the total number of bus operators who own a fleet of at least 30 buses for that fiscal year.
 2 The number of passengers carried in the three major metropolitan areas is an aggregate total for Saitama, Chiba, Tokyo, Kanagawa, Aichi, Mie, Gifu, Osaka, Kyoto and Hyogo.
 Source) MLIT

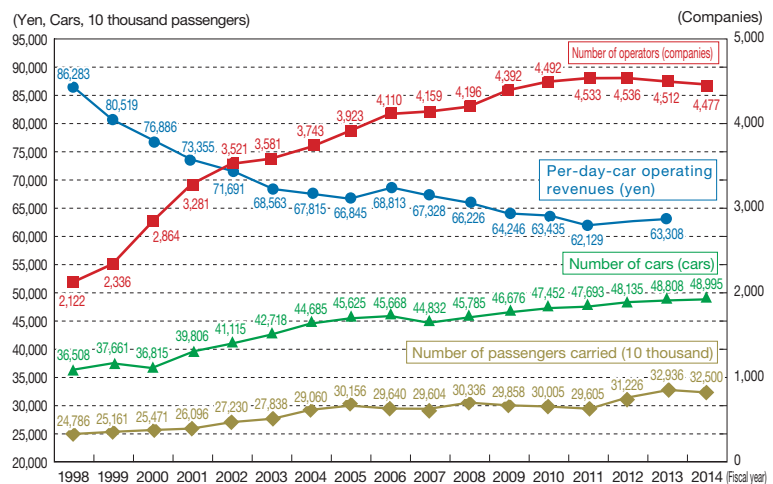
(ii) Chartered bus business

Since deregulations in February 2000, the chartered bus business has sponsored low-cost, diversified bus tours in its effort to deliver better user services, but competition is stiffening with increase in the population of operators in play. Furthermore, as group tours continue to be downsized and travel goods are lower-priced, transportation revenues have been declining. In addition, upsurges in the fuel charges continue to toughen the business climate surrounding the chartered bus business.

On the basis of the discussions at the Review Panel on the Future of the Bus Service that met in the wake of the April 2012 Kanetsu Expressway rapid tour bus accident, the Rapid and Chartered Bus Safety and Confidence Recovery Plan was worked out to carry on two-year efforts intended to add to the safety of rapid and chartered buses in FY 2013 and FY 2014.

Figure II-6-3-2

Chartered bus business overview



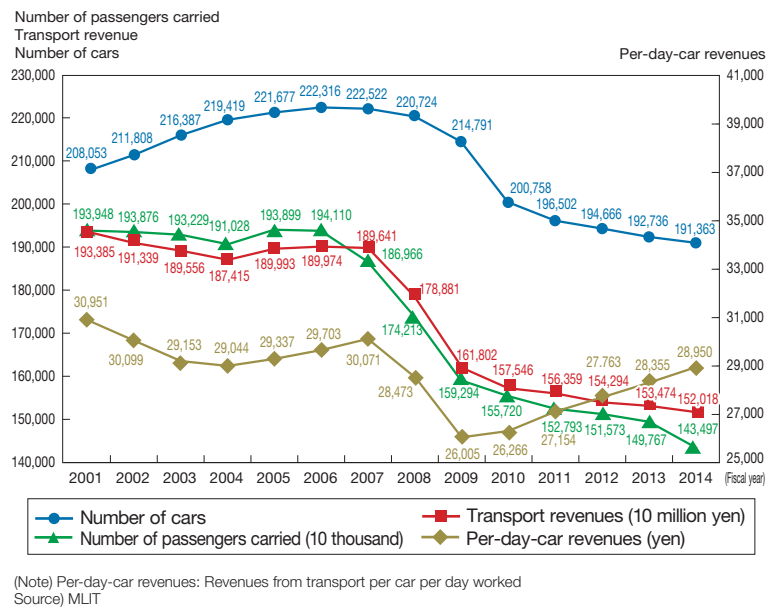
Source) MLIT

(iii) Taxi business

As for the taxi business, amendments to the “Act on Special Measures Concerning Rationalization and Revitalization of General Passenger Vehicle Transportation Businesses in Designated Districts” enforced in October 2009 were passed as a lawmaker-initiated legislation at the 185th extraordinary session of the Diet in 2013 to upgrade the drivers’ working conditions, enhance the level of taxi services and so on, and came into effect in January 2014.

The MLIT seeks to resolve the problems of the oversupply of taxis and upgrade services and safety on the basis of statutory regulations and collateral resolutions made at both Houses of the Diet.

Figure II-6-3-3 Developments in Per Day-Vehicle Reviews of Hires and Taxes



(2) Replacement driver service

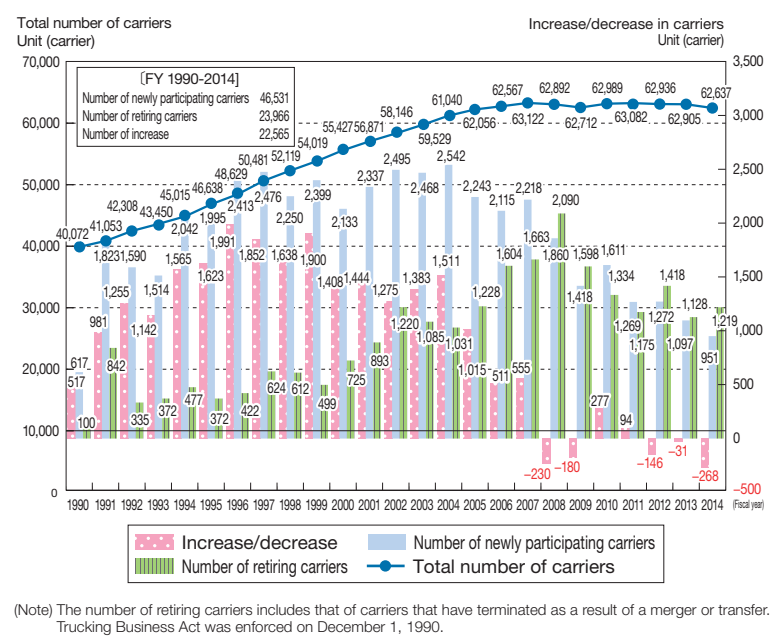
The replacement driver service is used as an alternate means of transport for drunken drivers. As of the end of December 2015, 8,866 replacement driver service providers are in operation. Keen to add to further soundness of the replacement driver service, the MLIT has formulated “Measures for Making the Replacement Driver Service More Sound for Added Safety and Security” in collaboration with the National Police Agency in March 2012 as part of its continuing effort to drive various relevant measures. Furthermore, the MLIT developed “measures to address issues concerning user protection toward appropriate operation of replacement driver services” in March 2016 in order to further ensure protection of users in replacement driver service, and these measures are scheduled for implementation starting from April 2016.

(3) Truck transport business

The number of motor truck carriers had been on the rise for long, but the number of carriers has been moving crabwise at about 63,000 since 2008.

Since about 99.9% of truck transport business operators are small and medium sized businesses, they are in a weak position in relation to shippers and other business partners and thus subject to such issues as not being able to receive appropriate fares and being forced to accept waiting time for convenience of shippers. Therefore, in FY 2015 we set up councils consisting of shippers, transport companies, relevant ministries and other relevant parties centrally and in each prefecture for full-fledged discussions to improve transactional environments, long working hours and productivity of the truck transport industry. In FY 2016 and onwards, we plan to implement pilot projects to create spe-

Figure II-6-3-4 Trends in the Number of Motor Truck Carriers



cific improvement case examples and disseminate/expand them.

Also, in light of concerns about labor shortages for truck drivers over the medium and long term, we will work on measures that contribute to improved productivity in the truck business by, for example, facilitating introduction of junction transportation, in addition to the above mentioned efforts.

(4) Securing and fostering bearers of motor carrier businesses, etc.

Motor carrier businesses that undertake the movement of people and goods (trucking, bus and taxi businesses, and automotive maintenance business that contributes to safety assurance in these businesses) are a social infrastructural industry of vital importance to sustaining Japan's economy and means of regional transportation.

A look into the employment structure of the motor carrier businesses, however, suggests that the workforce more or less depends on middle-aged and elderly workers, with female workers accounting only for about 2%. If this condition lasts, a serious shortage of bearers of these businesses is feared to occur in the future.

In the light of these circumstances, the MLIT has defined the year 2015 as the "first year of human resources securing fostering" and worked out its future approaches to analyzing current status across these businesses, identifying problems, encouraging the work of younger and female workers and so on.

For the truck business, in addition to having full-fledged discussions to improve transactional environments and long working hours at councils consisting of members that include shippers and other relevant parties, we are working on measures to secure bearers by, for example, enhancing information dissemination and awareness of business managers, leveraging "Female Truck Driver Promotion Project Site".

Furthermore, in the area of automotive maintenance, we will work to improve the image of mechanics in the mind of young people including women by promoting mechanics by visiting higher educational institutions and using posters in joint efforts of private and public sectors. Also, we are conducting surveys on the actual status and putting together improvement measures concerning the working environment and treatment of workers through expert review meetings.

Figure II-6-3-5

Employment Structure of the Motor Carrier Businesses, etc.

	Bus	Taxi	Truck	Automotive maintenance	Total industry average
Number of drivers and maintenance technicians	130,000 (FY 2014)	350,000 (FY 2014)	800,000 (2015)	400,000 (2015)	—
(Female ratio)	1.5% (FY 2014)	2.5% (FY 2014)	2.5% (2015)	1.3% (2015)	43.2% (2015)
Average age	49.2 (2015)	58.9 (2015)	47.3 (2015)	44.3 (2015)	42.3 (2015)
Working hours	209 hours (2015)	194 hours (2015)	218 hours (2015)	188 hours (2015)	177 hours (2015)
Annual income	JPY 4.26 million (2015)	JPY 3.09 million (2015)	JPY 4.37 million (2015)	JPY 4.21 million (2015)	JPY 4.89 million (2015)

(Notes) 1 The ratio of female in automotive maintenance is that for second level automotive mechanics.

2 Figures for working hours were estimated by the MLIT's Road Transport Bureau from scheduled hours worked + nonscheduled hours worked in the Basic Survey on Wage Structure. Scheduled working hours indicate the number of hours actually worked during the hours from start time and fish time on scheduled work days on June each year as stipulated in employment rules or other such documents of the business office.

Nonscheduled working hours indicate the number of hours actually worked outside the scheduled working hours and the number of hours actually worked on prescribed days off.

3 Annual income is the figures estimated by the MLIT's Road Transport Bureau from regular salary paid in cash x 12 + annual bonuses and other special salary in the Basic Survey on Wage Structure.

Regular salary paid in cash means salary paid in cash of six-months' worth (before deducting income tax, social insurance premiums, etc.) and include base salary, rank allowance, attendance allowance, commuting allowance, family allowance, overtime allowance and the like.

Annual bonuses and other special salary means the amount of bonuses and special salary such as fiscal year-end special allowance paid during the January-December period of the year preceding the survey year.

(Source) Prepared by the MLIT's Road Transport Bureau from Labor Force Survey by the Ministry of Internal Affairs and Communications, Basic Survey on Wage Structure by the Health, Labour and Welfare Ministry, Japan's Bus Service by the Nihon Bus Association and Hire-Taxi Year Book by the Japan Federation of Hire-Taxi Associations, and Automotive Maintenance White Paper by the Japan Automobile Service Promotion Association.

3 Trends in maritime industries and measures

(1) Achieving stable marine transportation

(i) Achieving Japanese-flagged vessels and Japanese seafarers

As Japan is a nation with limited resources surrounded by the sea in all its sides, international shipping, which depends on 99.6% of the Japan's trade, plays a significant role to its infrastructure for Japanese economy and national life. Maintaining a certain size of Japanese-flagged vessels and seafarers, over which Japan has regal jurisdiction, in peacetime is necessary in light of ensuring economic security assurance, the size has been on a declining trend due to loss of cost competitiveness in association with yen's appreciation and other factors.

In order to address these situations, the MLIT has worked to secure Japanese-flagged vessels and Japanese seafarers in a systematic manner by applying the tonnage tax system ^{Note} since 2008 to operators of outgoing ships certified by the plan

Note A tax system that calculates the amount of corporate tax on the basis of a predetermined deemed profit according to vessel tonnage, rather than yearly profits. Similar tax systems are already introduced in the world's major nautical nations.

for securing the Japanese-flagged vessels and Japanese seafarers under the Marine Transportation Law.

On the other hand, causing the terrible Great East Japan Earthquake and the nuclear power plant accident, the significance of economic security assurance through Japanese merchant fleets have been more actualized than before. Among of the situation, the Marine Transportation Law was amended in September 2012, establishing a deemed-Japanese-flagged vessel system. The deemed-Japanese-flagged vessel means a foreign-flagged vessel operated by Japanese shipping firm and owned by their overseas subsidiaries which can change its flag to Japan immediately in case of issuing the “Order to Engage in Voyage” based on Marine Transportation Law. Japan will support the increased Japanese-flagged vessels and secure the deemed-Japanese-flagged vessels to perform a complementary role of Japanese-flagged vessels.

Japan will pursue to consolidate stable maritime transport that is functional in times of emergencies, as well as at ordinary times, by measures and other approaches as mentioned.

(ii) Acquiring and fostering seafarers (Seamen)

Acquiring and fostering Japanese ship’s seafarers, human resources of marine transportation, is of essential importance to boosting Japan’s economy and maintaining and upgrading national life. Coastal shipping sailors are aging with about 50% of them being 50 years of age or older, and it is necessary to secure and foster a sufficient number of young seafarers so that bearers’ shortages will not occur when old seafarers retire in a large number. Therefore, we are striving to strengthen the system for supplying seafarers by such means as raising the quotas of education institutions for seafarers and expanding

employment outside such institutions, as well as to increase employment opportunities for new seafarers by supporting business operators that employ new seafarers in a systematical manner and holding job interviews for new graduates.

On the other hand, a certain number of ocean-going Japanese sailors need to be secured and fostered from economic security and other perspectives. Therefore, we are making efforts to secure Japanese seafarers, including steady implementation of the plan to secure Japanese vessels and seafarers.

As Asian seafarers account for a greater proportion of the total seafarers aboard Japanese merchant fleet, training aimed at improving the skills of mariner’s instructors in the developing nations has been conducted to help secure and foster more capable Asian seafarers.

The I.A.I. Marine Technical Education Agency (MTEA) and the National Institute for Sea Training (NIST) are the seafarers training institutions over which the MLIT holds jurisdiction. The MTEA not only provides the basic knowledge and skill required for a ship operating officer but also implements reeducation to meet shipping industry’s requests for to

Figure II-6-3-6

Trend in number of Japanese Seafarers Aboard International Vessels, Japanese Merchant Fleet

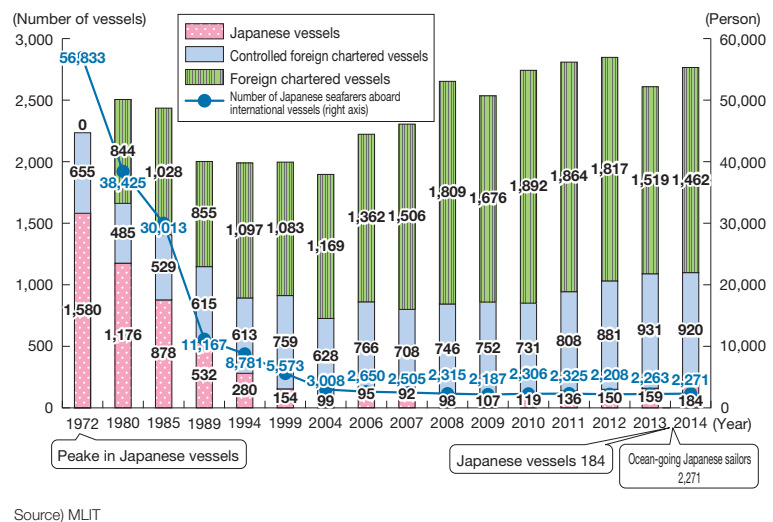
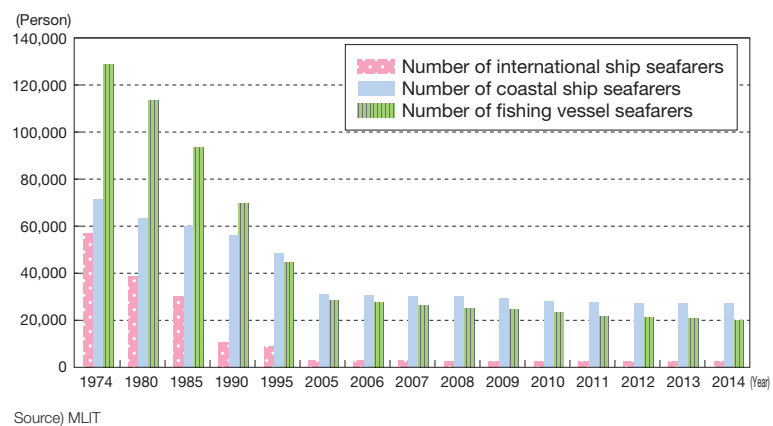


Figure II-6-3-7

Changes in the number of Japanese seafarers



catch up with technological innovations. The NIST provides unified on-board practical training on students at the MTEA, mercantile marine universities and colleges of technology using five training ships.

In April 2016, the two entities were consolidated into “the I.A.I.Japan agency of Maritime Education and Training for Seafarers(JMETS)” that provides classroom lecture and on-board practical training using training ships in an integrated manner.

The new entity, as a core seafarer educational institution, steadily pushes forward the securing and fostering young seafarers by advancing training contents and making the best use of its resources.

In addition to these efforts to secure and foster seafarers, continued efforts will be directed at promoting On-board Occupational Health and Safety Management System and Work Improvement on Board (WIB), a continual approach to reducing seafarers accidents to add to the vocational charms of the job of being a seafarer.

(iii) Disseminating Maritime Thought ^{Note}

While achieving stable marine transportation is crucial in supporting the Japanese economy and national life, the understanding of sea by the public is not necessarily sufficient.

The MLIT is making efforts of maritime publicity activities, such as sponsoring Sea-Festa (held in six cities and one town, including Kumamoto-shi, in 2015) and commending those who have been instrumental in helping Japan to grow into a maritime nation (Prime Minister’s Commendation).

(2) Marine transportation industry

(i) International shipping

The volume of cargo movement on ocean in the world for 2014 stood at 10.529 billion tons (up 3.5% year-on-year) with Japan’s volume of seaborne trade for the same year at 0.95859 billion tons (down 1.5% year-on-year).

International shipping in FY 2014 saw improvements in the business environment due to, among other factors, a moderate economic recovery in European and US countries and a decline in fuel oil prices, amid continuing severe circumstances such as economic decelerations in emerging countries and declining market conditions for farers due to oversupply of ships.

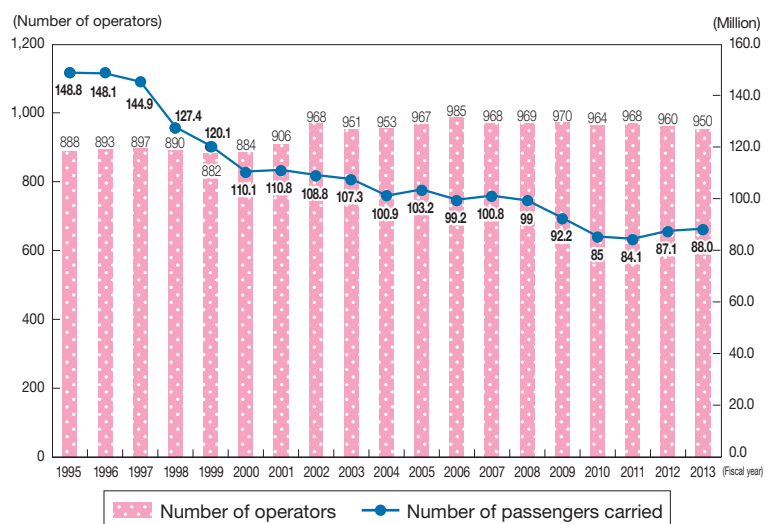
(ii) Domestic passenger shipping business

The domestic passenger shipping business plays a significant role as a means of regional transportation, and ferryboat transportation, in particular, has become a key mode of transportation for modal shifts in the nationwide logistics network. In the meantime, the domestic passenger shipping business needs to boost its competitiveness or toughen its structure, as by pushing further automation to cut costs, to break through a variety of confronting challenges, such as declining demand for transportation with changes in the demographic structure and soaring fuel prices.

Accordingly, a variety of support measures have been advanced in collaboration with local governments or operators, including making ships more energy-efficient through the utilization of co-owner ship construction institution of the Japan Railway Construction, Transport and Technology Agency, adding to the charms of voyage by sea and augmenting user convenience in conjunction with the

Note General knowledge of seas in general, including marine usage, maritime transportation and marine environments and maritime safety.

Figure II-6-3-8 Trends in the Number of Domestic Passenger Ship Operators and Number of Passengers Carried



(Notes) 1 Sum total for general passenger liner routes, specified passenger liner routes and passenger non-liner routes
2 Number of operators as of April 1 of each year (as of August 1 for 1965-1969)
Source) MLIT

tourism industry.

(iii) Coastal shipping

Coastal shipping offers high economic efficiency and excellent shipping characteristics in terms of environmental protection. Coastal shipping is a key means of conveyance supporting Japan's economic activity and national life, as it commands about 40% of domestic distribution and about 80% of industrial basic material transport. In recent years, the economy is on a recovery trend but the overall freight transportation volume was lower compared to FY 2014 due to reaction to the hike in demand before the consumption tax increase and impact of the Chinese economy. In the meantime, the building of new ships continues strong but overage ships still account for a bulk of the total ship population. Promoting shipbuilding to replace at a steady pace, coupled with efforts to simplify the flow of shipping, should be the key to assuring stable shipping while responding precisely to demand changes.

To address such circumstances, the MLIT has reduced charter ages by taking advantage of joint ownership shipbuilding scheme of Japan Railway Construction, Transport and Technology Agency, an independent administrative agency, and offered exceptional tax measures to encourage migration to building ships that offer superior environmental performance, thereby pushing the implementation of measures aimed at building competitiveness, as by saving ship energy requirements. The MLIT formulated and publicized "Guidelines for Ship Management Activities in Coastal Shipping" to help reactivate coastal shipping that leverages ship management firms in July 2012 and also introduced techniques for assessing compliance with the Guidelines in April 2013 to "visualize" the management services provided by the ship management firms. Furthermore, the smooth and steady implementation of provisional measures for coastal shipping ^{Note} is also supported.

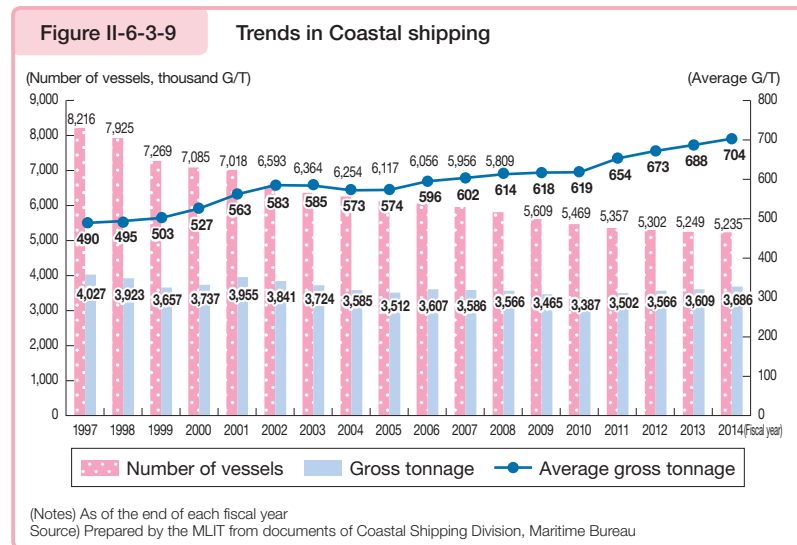
(iv) Port and harbor transportation business

The port and harbor transportation business plays a significant role as an interconnecting node between marine sea and land transportation in support of Japan's economy and national life. As of the end of March 2015, there are 874 transporters (0.5% down from the previous year) in the general port and harbor transportation business at the 93 ports nationwide that are governed by the Port and Harbor Transportation Business Act. Vessel loading and unloading volumes for FY 2014 were approximately 1,438 million tons nationwide (down 0.4% from the previous year).

(3) Shipbuilding industry

(i) Present status of the shipbuilding industry

Japan's shipbuilding industry is an extremely important industry that contributes to regional economy and employment by providing a stable supply of quality vessels tailored to ship owner's varied needs. Japan possesses a clustered integration of maritime industries in which the marine transport business, shipbuilding business and ship machinery business are closely linked to one another.

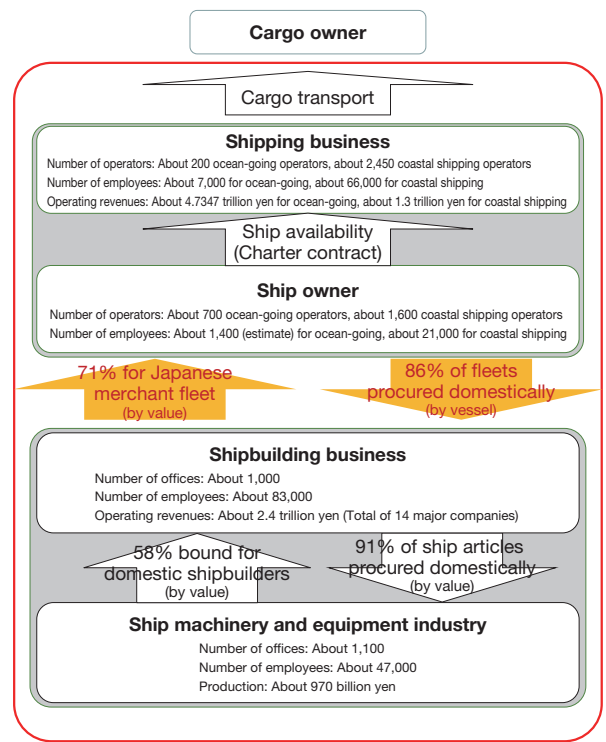


Note A system that resolves the owned tonnage adjustment program based on a scrap and build principle and that grants a certain amount of subsidy to those who have dismantled and removed their ships and that demands the shipbuilders to pay fees.

Following the increases in the volume of marine transportation reflecting a buoyant global market, China and Korea stepped up their shipbuilding capacities rapidly, pushing the world's amount of new shipbuilding for 2015 to 68,730,000 gross tons (against 13,020,000 gross tons for Japan, commanding 18.9% of the global market). Japan's order volume has turned upward on the support of corrections of the yen appreciation since the end of 2012, but stiff global competition continues, keeping tonnage values low.

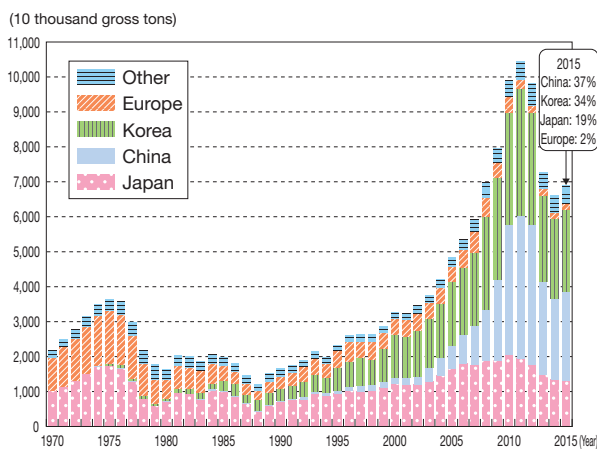
The production of ship machinery products (except for outboard motors) for 2014 was valued at 800.5 billion yen (up about 12.4% from its year earlier level), with an export amount of 220.6 billion yen (down about 7.8% from its year earlier level). This is the first increase in six years due to a rise in orders for new shipbuilding; however, the climate surrounding the ship machinery and equipment industry remains severe due to stiffening international competition, increasingly aging workforce and other factors.

Figure II-6-3-10 Japan's maritime industry cluster



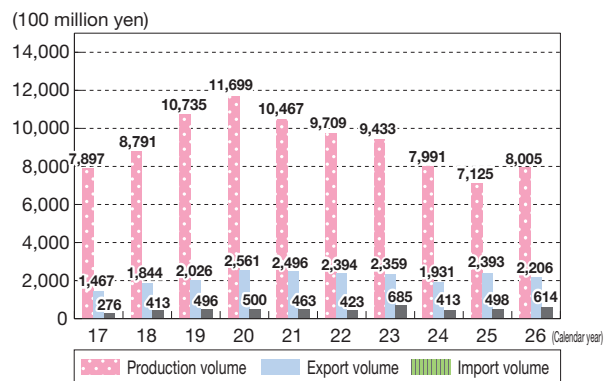
Source) MLIT

Figure II-6-3-11 Developments in the Volume of Newly Built Ships in the World



Source) Prepared by MLIT from IHS (former Lloyd's Register of Shipping)

Figure II-6-3-12 Developments in Japan's Production, Export and Import of Marine Industrial Products



(Note) Import volumes represent imports by shipbuilders. Excluding outboard engines and spark-ignited engines. Source) MLIT

(ii) Approaches to consolidating the international competitiveness of the shipbuilding industry

To consolidate the international competitiveness of Japan's shipbuilding industry and allow Japan to stay a first-class shipbuilding nation, the implementation of a policy package focusing on boosting Japan's order-taking capacities and deployment into new markets and new segments of business, and assurance and cultivation of human resources, have been propelled.

Starting from FY 2013, support has been extended to shipbuilders, shipping operators and the like in their efforts to develop next-generation marine environment technologies that help enhance fuel efficiencies for their vessels with a view to reinforce Japan's order-taking capacities. The Ministry is committed to realizing a desirable framework of international collaboration under cooperation between the public and private sectors and exploring, and promoting the diffusion of, energy-saving technologies for ships and so on.

Also, efforts on the establishment of marine transportation systems for North American shale gas and other new energy

transportation routes are promoted. As for the availability of human resources in the shipbuilding industry, the utilization of foreign human resources ready for work has been pursued as an emergency and temporary response (scheduled for expiry in FY 2020) while adhering to the key principle of seeking human resources from within Japan. For domestic human resources, specific measures are being implemented with industry-academia-government collaboration, which include promotion of internships for high school teachers and students to deepen their understanding on appeals of shipbuilding.

In addition to building on efforts made up until now, we will take various measures in a comprehensive manner to drive forward production reforms that increase product/service capabilities, ability to develop new business areas and shipbuilding capability/talent through innovations in the maritime industry by utilizing rapidly advancing information technologies, thereby contributing to stronger economy and regional revitalization.

(4) Ocean industries

The marine resources development, represented by subsea oil and natural gas production, is an area where medium- to long-term growth is expected. Since many types of ships are used in this area, it is hoped that the Japanese maritime industry expands into this area, leveraging technologies and experience accumulated, and taps global growth for the economic growth of Japan. To this end, we are promoting efforts toward establishment of consortiums for training engineers in this area through industry-academia-government collaboration, in addition to supporting technological development relating to marine resources development, in order to enhance international competitiveness of Japan's ocean industries.

4 Trends in air transport business and measures

In regards to circumstances surrounding the aviation industry, demand was robust overall due to, among other factors, a moderate recovery in domestic and overseas economies, cheaper oil prices and a rise in the number of inbound foreign visitors. According to Japan's air transport results, the number of domestic air passengers, which had moved downward after peaking in FY 2006, turned for an increase from FY 2012 on, with impetus from demand for restoration from the Great East Japan Earthquake, increased demand encouraged by the entry of LCCs and so on, reaching 95.19 million in FY 2014 (up

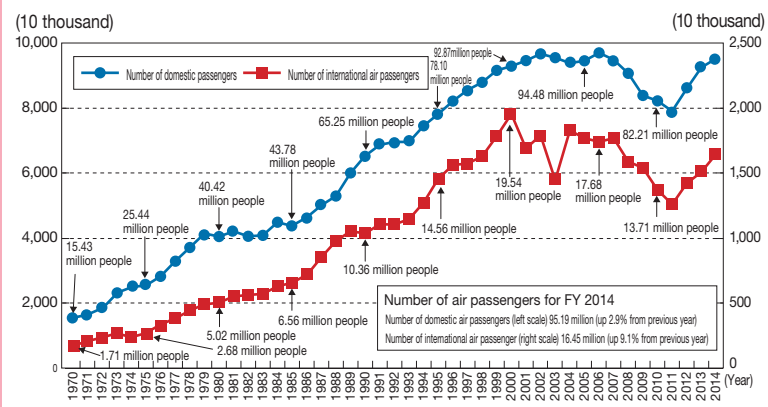
2.9% from a year earlier level). The number of international passengers also turned for the increase from FY 2012, reaching 16.45 million (up 9.1% from a year earlier level), same as the domestic passengers.

Since March 2012, LCCs entered the Japanese market one after another with four LCCs operating as of March 2016. LCCs have been expanding their business activities with Peach Aviation operating 13 domestic routes and nine international routes; JetStar Japan, 17 domestic routes and five international routes; Vanilla Air, three domestic routes and three international routes and Spring Airlines, two domestic routes and two international routes.

In the meantime, Skymark Airlines filed for the commencement rehabilitation proceedings under the Civil Rehabilitation Law on January 28, 2015. Court-led proceedings are now underway.

Figure II-6-3-13

Developments in the number of air passengers (Japan-based airlines)



Source) Prepared by MLIT from the "Air Transportation Statistical Year Book"

5 Trends in the Consigned Freight Forwarding Business and Measures

The consigned freight forwarding business ^{Note} is combined with multiple means of transport to provide services specific to varied user needs. Recent years have witnessed growing entry into the aircraft- and ship-based segments of international shipment to reflect the cargo owners' needs for globalization.

Further, as international trade takes on an increasingly important tone, global shipment gets more streamlined than before, urging safety assurance during transportation. The MLIT works to ensure the availability of safe and secure logistics services, as by conducting audits, etc. to consolidate thorough operator code compliance.

6 Trends in the warehousing business and measures

Commercial warehouses play a significant role as nodal points of physical distribution. There are 6,030 warehouse operators (4,849 ordinary warehouse operators, 1,181 refrigerated warehouse operators) as of the end of FY 2014. In recent years, the construction of large, intelligent physical distribution facilities by foreign or domestic real estate entities or funds has been activated, giving birth to warehouse operators who rent such facilities to develop their businesses.

The introduction of equipment that makes for a lower-carbon implementation is underway, as well as the introduction of emergency power supplies and telecommunications equipment that help build a disaster-tolerant warehouse.

7 Trends in the truck terminal business and measures

The truck terminal business plays a significant role in streamlining the flow of transport, mitigating congestion and so on as a nodal point of trucking between a trunk line and a terminal. In recent years, the construction of facilities that provide the functionality of a distribution center (sorting, processing for distribution and so on), as well as loading and unloading, is in progress to meet the sophisticated and diversified needs for logistics.

The introduction of equipment that makes for a lower-carbon implementation is underway, as well as the introduction of emergency power supplies and telecommunications equipment that help build a disaster-tolerant truck terminal.

8 Trends in the real estate business and measures

(1) Real estate business trends

The real estate business is one of the key industries that command 2.6% of the total sales of all industries and 11.1% of the total number of corporations (FY 2014).

According to the 2016 official land prices (as of January 1, 2016), the national average of residential land prices fell but the rate of decline was smaller, while commercial land prices, which were flat last year, took an upward turn. The average for the 3 major metropolitan areas continued the rising trend for both residential properties and commercial properties. On the other hand, land prices in rural areas continued the downward trend for both residential and commercial land, though the rate of decline was smaller. The number of new housing starts, after exceeding 890,000 in FY 2012, topped 980,000 in FY 2013 but sagged to 880,000 in FY 2014 upon loss from rebounding from the last-minute demand stirred by a hike in the consumption tax rate.

Note A business that transports cargoes by the means of transport (motor trucks, railways, aircrafts, ships) owned by real carriers (who undertake transportation by themselves) in a fully integrated, complex flow of door-to-door transportation, from picking up cargoes to delivering them.

In the existing housing distribution market, the number of successful deals was 173,000 in FY 2015 (up 9.5% from the previous fiscal year) according to the Real Estate Information Network System (REINS) ^{Note 1}.

(2) Status of the real estate industry

The Ministry endeavors to ensure precise administration of the Real Estate Brokerage Act to protect consumer interest involved in housing land and building deals and to expedite distribution. The number of real estate dealers was 122,685 at the end of FY 2014.

The MLIT, along with prefectural and municipal governments, endeavor to prevent complaints and disputes by working in conjunction with the bodies concerned while imposing severe supervisory dispositions on those entities that have breached the law. In FY 2014, 249 supervisory dispositions were imposed (including 141 revocations of licenses, 74 suspensions of business and 34 orders).

To combat the problems of malicious soliciting at the time of condominium sale, the Ministry will continue to alert consumers through its Website or other means and work together with the agencies concerned to provide relevant supervision and guidance to define the acts that are prohibited in soliciting in connection with real estate brokerage.

To ensure proper management of growing stocks of condominium, a system of registration for condominium management services entities and service regulations have been enforced to ensure their proper management in accordance with the Act on Advancement of Proper Condominium Management. As of the end of FY 2014, the number of condominium management service entities was 2,214. From a viewpoint of promoting the code compliance of condominium management services entities, on-the-spot inspections have been conducted.

Since December 2011, a “system of rental housing management entity registration” that places a certain set of rules on the fulfillment of rental housing management services has been put into effect to foster and develop a good-quality rental housing business. As of the end of FY 2014, the number of registered rental housing management entities was 3,538.

(3) Conditioning the environment for market reactivation

(i) Status quo of the real estate market

Japan’s real estate had a total asset value of about 2,400 trillion yen as of the end of FY 2014 ^{Note 2}.

The book value of the real estate or the trust beneficiary interest in real estate that were acquired by J-REITs (real estate investment corporation), real estate specified joint enterprises, special-purpose companies and so on as objects of securitization during FY 2015 stood at about 5.4 trillion yen.

J-REITs play a central role in the real-estate investment market. As many as five brands were newly listed in just one year in FY 2015. As of the end of March 2016, 53 brands were listed on the Tokyo Stock Exchange. Total book value of assets under management of J-REITs amounts to 14 trillion yen and the market value of the real-estate investment securities adds up to about 12 trillion yen.

The Tokyo Stock Exchange REIT Index, which indicates price movements of the overall J-REIT market, increased 1.7% over the fiscal year because positive factors, such as improved conditions for the real estate market, an increase in inbound consumptions due to the rising number of inbound foreign visitors and the introduction of negative interest rates by the Bank of Japan, were partially offset by concerns about possible declines in demand due to successive public offerings and a plunge in the Chinese stock market.

The amount of yearly property acquisition in J-REITs stood at about 1.6 trillion yen for 2015.

Note 1 Real estate brokers have property information loaded on REINS for them to exchange. As property deals are concluded successfully, the relevant information, including the transaction prices, is stacked on REINS.

Note 2 A sum total of the values of the buildings, structures and land calculated on the basis of National Accounts.

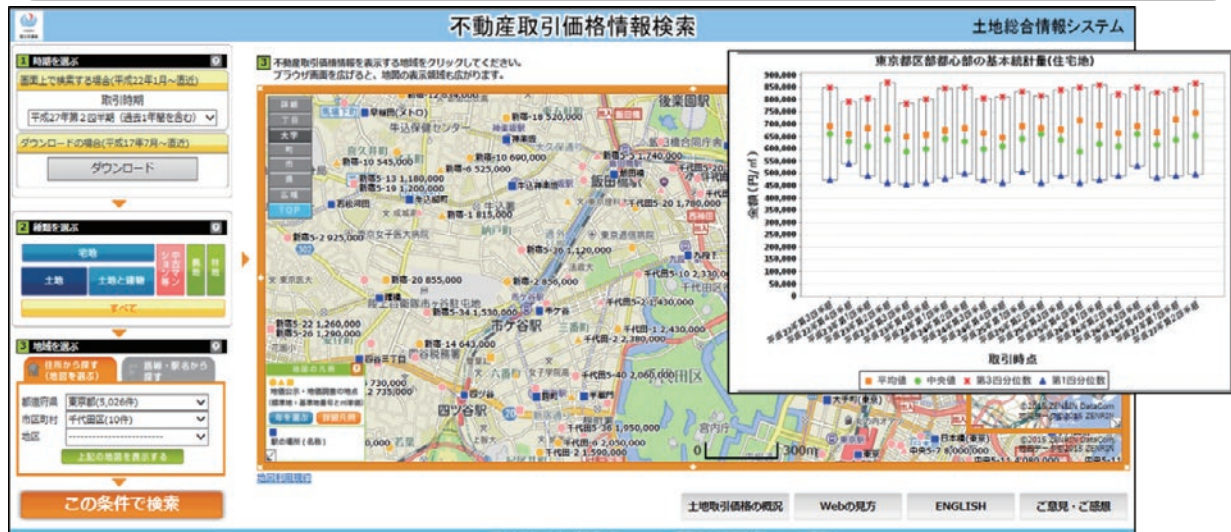
(ii) Conditioning the environment for real-estate information

The MLIT surveys real estate transaction prices, etc. nationwide in a bid to make the real estate market more transparent, streamline, and reactivate deals. Information thus collected from such surveys, including locations, areas and prices of real properties traded, is uploaded at a Website on the Internet (Land General Information System ^{Note 1}) with due care taken to prevent identification of the individual properties (as of March 2016, the number of transactions published was 2,650,557 and the number of visits to the website was about 620 million). In order to improve convenience of users, in April 2016, downloading multiple years' information on real estate transaction prices in bulk was made possible and information provision services through API ^{Note 2} started.

As a lesson learned from the subprime crisis, the MLIT publishes property price index (residential) in accordance with the guidelines prepared by international institutions for providing early warning signals for real estate bubble, and started pilot operation for property price index (commercial) in March 2016.

Figure II-6-3-14 Land General Information System

- Since April 2006, transaction price information based on questionnaires conducted among parties to real-estate deals has been posted every quarter at a MLIT website with care to protect the properties in question from being identified easily.
- As of March 2016, information on 2,650,557 properties was posted, attracting a total of about 620 million Web accesses.



土地総合情報システム Land General Information System

平成25年第3四半期～平成27年第2四半期の東京都千代田区の土地取引件数 1,409 件

検索条件: [種類] 土地 [地域] 東京都 千代田区 [取引時期] 平成25年第3四半期～平成27年第2四半期

検索結果: 35件中 1件目 ~ 20件目を表示中(1/2ページ目)

詳細表示	所在地	地域	名称	用途	取引時期	坪単価	面積	㎡単価	形状	専有目的	幅員	経緯	方位	建物	築年	用途	取引時期
1	千代田区一橋町	住宅地	平野門	3階	460,000万円	650万円	2,000㎡以上	200万円	1階建	8.0m	区道	北東	2階建	60%	400%	H25/10-12月	
2	千代田区船橋	商業地	船橋	4階	5,400万円	320万円	40㎡	97万円	1階建	6.0m	区道	北東	商業	80%	600%	H26/01-03月	
3	千代田区内神田	商業地	小川町(東側)	5階	11,000万円	530万円	70㎡	160万円	1階建	6.0m	区道	北	商業	80%	600%	H26/10-12月	
4	千代田区船橋	商業地	神田(東側)	4階	11,000万円	540万円	70㎡	160万円	1階建	4.0m	区道	北西	商業	80%	600%	H26/04-06月	
5	千代田区船橋	商業地	神田(東側)	2階	90,000万円	1,000万円	300㎡	300万円	1階建	10.0m	区道	南東	商業	80%	600%	H26/01-03月	
6	千代田区船橋	商業地	船橋	2階	31,000万円	1,100万円	90㎡	340万円	1階建	22.0m	都道	南東	商業	80%	600%	H25/10-12月	

Source) MLIT

(iii) Conditioning the existing home circulation market

The MLIT is working to condition the existing home trading environment to promote the circulation of existing homes, which have only a low share of the total volume of housing in circulation when compared with the U.S. and Europe. In FY 2015, the MLIT implemented test operation of a prototype system in an effort to establish a system for efficiently aggregating information relevant to real-estate transactions, such as transaction histories, transactions examples in the surrounding districts, potential disaster risks and statutory restrictions, and examined how real estate brokers should

Note 1 <http://www.land.mlit.go.jp/webland/>

Note 2 API (Application Programming Interface): API enables use of functions of certain computer programs (software) or managed data by invoking other external programs.

provide relevant information by partnering with other business operators specialized in areas related to real estate transactions. Also, the MLIT revised the “price appraisal manual” used by real estate brokers for disseminating and embedding the approaches of the “Guidelines for Improving Building Assessments Relevant to Existing Homes” formulated in FY 2013, and put together points that should be noted by real-estate appraisers in conducting appraisal of existing detached houses.

(4) Building a real-estate market tailored to new ages

The MLIT is striving to disseminate the revised real-estate appraisal standards, etc. (effective November 1, 2014), which reflects the diversified needs for real estate appraisals, such as those emerging from a globalized real-estate market, a progressing stock society and development of a real-estate securitization market.

On-site inspections of real-estate appraisers and appraisal monitoring surveys concerned mainly with facts about securitized real-estate appraisals have been conducted to enhance appraisal reliability.

Previously, properties acquired by REITs were mainly offices and residences. In recent years, however, types of properties acquired are expanding to hotels, logistics facilities, healthcare facilities and the like. Amid diversification of properties targeted by REITs, we published the guidelines for REITs that target real estate properties of hospitals in June 2015 and held seminars for business operators engaged in healthcare related businesses.

Also, in order to promote private-sector funding in updating urban functions such as earthquake resistance for buildings, we implemented model projects so that real estate regeneration projects utilizing the framework of the Amended Real Estate Specified Joint Enterprise Act (enforced on December 20, 2013) will be carried out, while working to spread real estate securitization in local districts by sending experts to real estate securitization projects taking place in regional cities.

In promoting the formation of earthquake resistant/green buildings, we decided to investment in environmental renovation projects for two buildings in FY 2015.

The MLIT held a meeting of the “Committee for the utilization of Public Real Estate (PRE) Using Real Estate Securitization and Other Techniques” and formulated guidelines for local public entities with the aim of promoting the utilization of PRE owned by local public entities and thus to achieve further expansion of the real estate investment market. The MLIT is determined to disseminate guidelines for local public entities and implement associated model projects.

The MLIT held the policy meeting on the real estate investment market, and put together recommendations on growth strategies for the real estate investment market concerning the growth target of doubling total assets of REIT, etc. to about 30 trillion yen by around 2020 and specific initiatives (March 2016).

9 Building a sustainable construction industry

(1) Conditions surrounding the real estate business

The construction industry not only takes charge of the development, maintenance, management, etc. of local infrastructures but underpins local economies and employment, keeping local communities safe and secure on the front line in support of the national life and social economy.

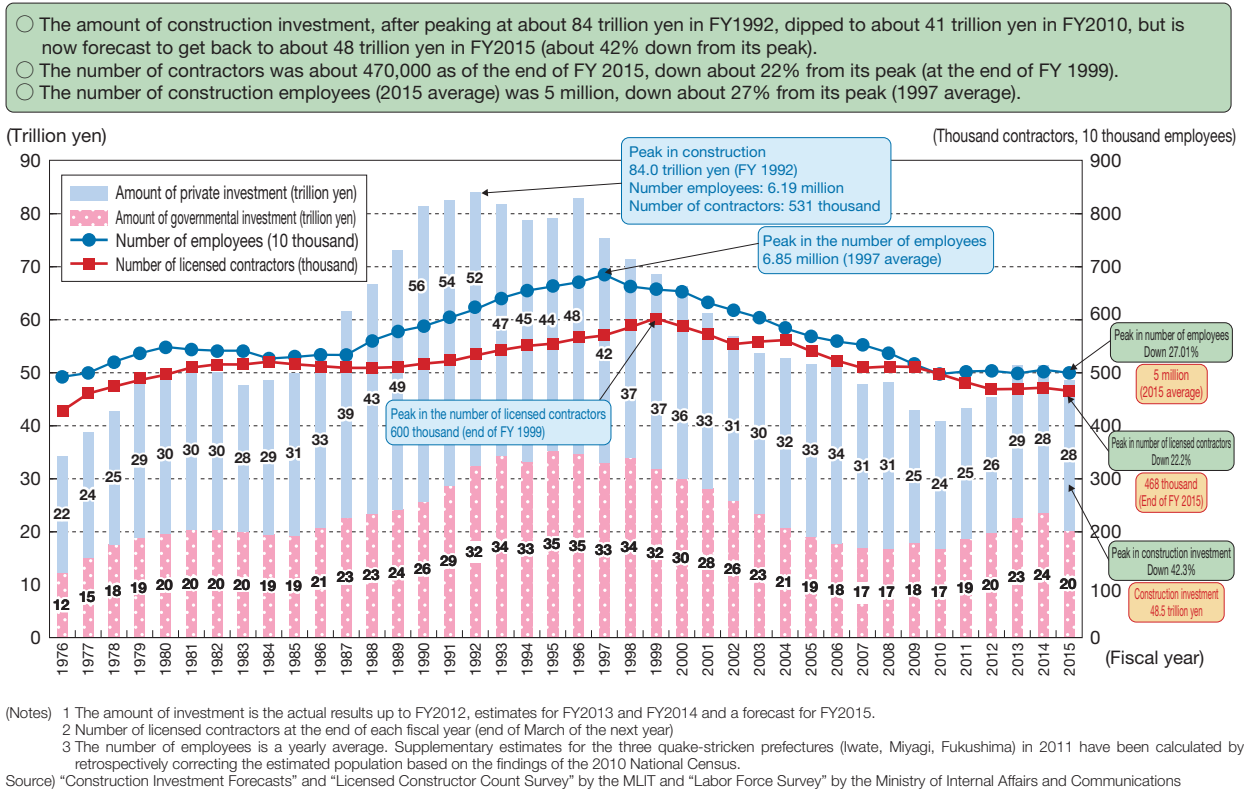
On the other hand, in association with a sharp decline in construction investment, the business environment surrounding construction companies has deteriorated and structural issues such as a decrease in the number of young people joining the industry and aging workforce.

In order for the construction industry to address these issues while fulfilling its roles in disaster prevention/mitigation, countermeasures against aging infrastructures, maintenance and earthquake resistance measures, it is crucial to make the industry sustainable over the medium to long term.

Figure II-6-3-15 shows the trends in construction investment and the number of licensed contractors and employees.

Figure II-6-3-15

Changes in Construction Investment, Number of Licensed Contractors and Number of Employees in the Construction Industry



(2) Securing and fostering human resources to work for the construction industry

The construction industry builds on a large number of human resources. While the number of employees in the construction industry shows signs of pickup in recent years, it would be important for the MLIT to direct its continued efforts at securing and fostering industry leaders, including young workers, to enable the construction industry to continue playing its role as a community supporter in the background of falling birthrates with aging populations.

To this end, the MLIT is working to refurbish the environment that makes construction builder confident about their future prospects, including a continued, stable supply of public works funding, in addition to improving the labor conditions drastically, such as maintaining appropriate wage levels and encouraging their subscription to social insurance and other security programs. The MLIT revised the eligibility for technical certification tests to facilitate early use of young workers, and is keen to enhance education and training in the industry to facilitate smooth transfer of skills from generation to generation. Moreover, the MLIT aims to double the number of female technicians/skilled workers in five years in order to further increase women's engagement in the construction industry based on the action plan formulated in joint efforts of private and public sectors.

Moreover, the MLIT will be working to help boost productivity in the construction industry, such as by introducing i-Construction at construction sites and improving the heavily tiered subcontracting structure, in light of declines in working population in the future.

United public-private approaches will be driven to encourage more people to join in the construction industry and let them concentrate on their jobs with pride.

In addition, the project of receiving foreign construction workers is in place since April 1, 2015 as a time limited measure to handle increased construction demand due to one-off factors such as hosting of the 2020 Tokyo Olympic and Paralympic Games. Under this framework, 401 foreign construction workers entered Japan (as of March 31, 2016).

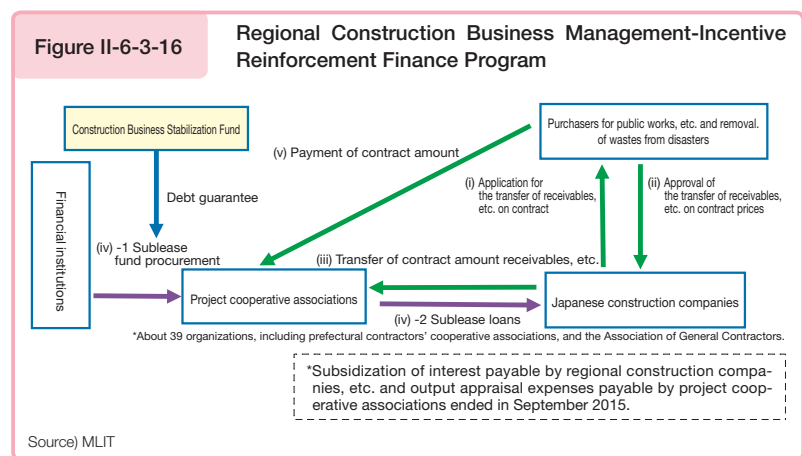
(3) Establishing a framework of fair competition

As the construction industry takes charge of the jobs of keeping local communities safe and secure, as through the development, maintenance, management, etc. of local infrastructures, it needs to establish a framework of fair competition among contractors, including thorough legal compliance, to enable those of them who are superior in their technical strength, construction capability and management power to keep up with their growth. To this end, the Ministry has been working to normalize the practice of deals between prime contractors and subcontractors in the construction business by conducting subcontracting transaction status surveys, on-the-spot surveys, etc., opening a desk for consultation services on troubles and other problems encountered in concluding construction work contracts as “Construction Business Transaction Normalization Center” and the Construction Business Normalization Promotion Month.

(4) Measures aimed at supporting construction companies

(i) Regional construction business management-incentive finance program

The regional construction business management-incentive finance program allows prime contractors to acquire loans from money lending business operators (e.g., cooperative association) on security of the public works contract price credit obligations, according to the completed amount of works. Its purpose is to smooth their cash flow. This program aims to secure loan funding and reduce the borrowing rate and other costs by providing debt guarantee to sublease loans, which the money-lending operator borrows from financial institutions when extending loans.

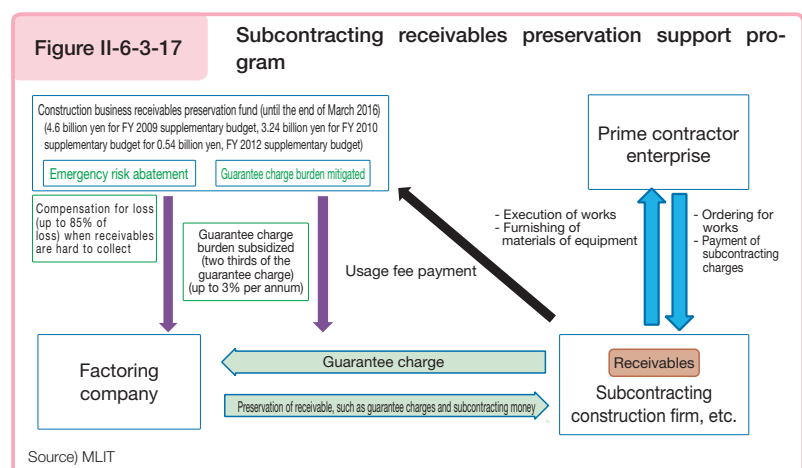


Effective since November 2008, this program will be carried forward through FY 2016 and onwards.

(ii) Subcontracting receivables preservation support program

The subcontracting receivables preservation project aims to prevent chain-reaction bankruptcies of subcontractors in association with failure of their primary contractor by reducing the burden of guarantee charge when the payment of such receivables is guaranteed by a factoring company^{Note} and by indemnifying the factoring company for part of losses, it may suffer upon fulfillment of the guaranteed obligations.

This program has been implemented since March 2010 and will be carried on through FY 2016.



Note A financial enterprise that collects receivables owned by others by guaranteeing or purchasing them. At present, 10 factoring companies, including bank subsidiaries, prepayment guarantee companies and leasing companies, run this service.

(iii) Regional construction industry revitalization support project

In the regional construction industry revitalization support project, regional revitalization support advisers, including human resources development experts and small and medium enterprise management consultants, provide wide-ranging advice that help resolve management tasks or technical tasks, such as execution management tasks, to smaller or middle-ranking construction companies and construction-related businesses (such as surveying, construction consulting and geological surveying) as they work to develop, and maintain and manage social infrastructures and to get prepared for, and reduce the impact of, disasters in support of communities. In addition, for exemplary initiatives where multiple companies or other organizations collaborate and contribute to securing and fostering of industry bearers and higher productivity, we provided continued support by a team of experts until set goals such as plan development are achieved (consulting support) and subsidizing part of expenses in the phase of implementing the plan (step up support) as priority support projects. In FY 2015, we provided consulting support in 22 cases and step up support in 17 cases.

This program has been implemented since 2015 and will be carried on through FY 2016.

(5) Promoting construction-related businesses

Information about the total number of operators registered in the construction-related businesses (such as surveying, construction consulting and geological surveying) for each month is published at the end of the next month and analyses of the financial conditions by sector based on that information are released at the end of the next fiscal year. In addition, the MLIT works to encourage sound growth of the construction-related industries and make effective use of the registration system, as by holding explanatory sessions for students before attending school in collaboration with the associated bodies.

(6) Present status of construction machinery and growth of construction production technologies

Present status of construction machinery and growth of construction production technologies Pursuant to the second-phase “Computer-Aided Construction Promotion Strategies” (formulated in March 2013), to encourage and diffuse the practice of computer-aided construction, the MLIT seeks to promote proactive use of total station making for simplifying the work flow of piecework management by converting survey results to data automatically for example, and machine control/machine guidance technologies realizing high-precision and efficient construction under automated control.

(7) Settling disputes arising from the execution of construction works

To promptly resolve disputes arising from the execution of construction work contracts, the Construction Works Dispute Review Panel implements dispute settlement procedures. In FY 2014, the Panel received 40 applications (six of arbitration, 27 for conciliation and seven for mediation) at the central level and 86 applications (21 for arbitration, 56 for conciliation and nine for mediation) at the prefectural level.

Chapter 7

Building a Safe and Comfortable Society

Section 1 Realizing a Universal Society

1 Realizing Accessibility through a Universal Design Concept

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

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

(1) Accessibility of Public Transportation

In accordance with the “Act on Promotion of Smooth Transportation, etc. of Elderly Persons, Disabled Persons, etc.”, public transportation administrators are required to comply with “Accessibility Standards for Public Transportation” when carrying out new development of passenger facilities or large-scale improvements as well as introducing new vehicles and for existing facilities. Efforts must be made to comply with these standards and staff must be educated and trained as needed to strive for accessibility as part of the stipulated requirements for mandatory efforts. In addition, assistance measures are available to support the accessibility of passenger ships as well as train stations and other passenger terminals along with the implementation of non-step (low-floor) busses, lift-equipped busses, welfare taxis, and other initiatives.

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

(as of March 31, 2015)

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

	Total Facilities	Passenger Facilities Compliant with Accessibility Standards for Public Transportation (No Grade Barriers)	Percentage of total number of facilities
Railway stations	3,497	2,964	84.8%
Bus terminals	49	41	83.7%
Passenger ship terminals	15	15	100.0%
Airport passenger terminals	34	29	85.3% (100%)

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

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

○Vehicles

	Total Number of Vehicles, etc.	Vehicles Compliant with Accessibility Standards for Public Transportation	Percentage of total number of vehicles
	End of FY 2014	End of FY 2014	End of FY 2014
Railway carriages	52,203	32,389	62.0%
Low-floor busses (excluding exemption-certified vehicles)	44,874	21,074	47.0%
Lift-equipped busses (excluding exemption-certified vehicles)	15,105	856	5.7%
Welfare taxis	—	14,644	—
Passenger ships	674	217	32.2%
Airplanes	574	543	94.6%

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

2 Since the way in which targets for busses are formulated has changed between the old and new versions of the basic policy, items differ as outlined in Exhibits 1 and 2.

Source) MLIT

(2) Accessibility of Living and Housing Environments

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

Source) MLIT

(ii) Accessibility of Walking Spaces

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

(iii) Accessibility of Urban Parks and Other Areas

For the development of urban parks, there are standards and subsidies under the “Barrier-free Law” for safe and comfortable usage, 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.

(3) Promoting Universal Design for the Olympics and Paralympics

In order to promote the development of a society that adheres to the precepts of universal design (in terms of a full recognition of the need for accessibility and urban planning) in response to the impending arrival of the Tokyo Olympics and Paralympics in 2020 and implement measures to leave behind a concrete legacy after the Games come to an end, a network of ministries and agencies with ties to Universal Design 2020 was set up in February 2016 under the purview of the Headquarters for the Promotion of the Tokyo Olympic and Paralympic Games. This network will organize hearings involving the participation of disabled advocacy groups and is slated to issue, in August 2016, an interim summary for which feedback from disabled persons will be taken into account. By the end of 2016, a final summary for Universal Design 2020 is expected to be released.

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

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

(i) Supporting the Supply of Housing Suitable for Child-rearing Households

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

(ii) Promotion of Teleworking

Teleworking, a flexible work style that uses information and communication technology for the freedom to work anywhere, promotes workforce participation by various persons including women, contributes to vitalization of communities such as local cities through creation of new workplaces, and requires 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.

The “Declaration to be the World’s Most Advanced IT Nation” decided by Cabinet on June 30, 2015, 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.

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

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

To ensure the safety and comfort of children and other park users, various facility administrators are made aware of “Guidelines 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 2014 is implemented at 1,007 housing projects (25,523 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 ^{Note} is being promoted and as of the end of FY2014, 16,612 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 FY2014, 3069 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 private fee-based passenger transport services are required to ensure the passenger transport which is necessary for the living of the local residents.

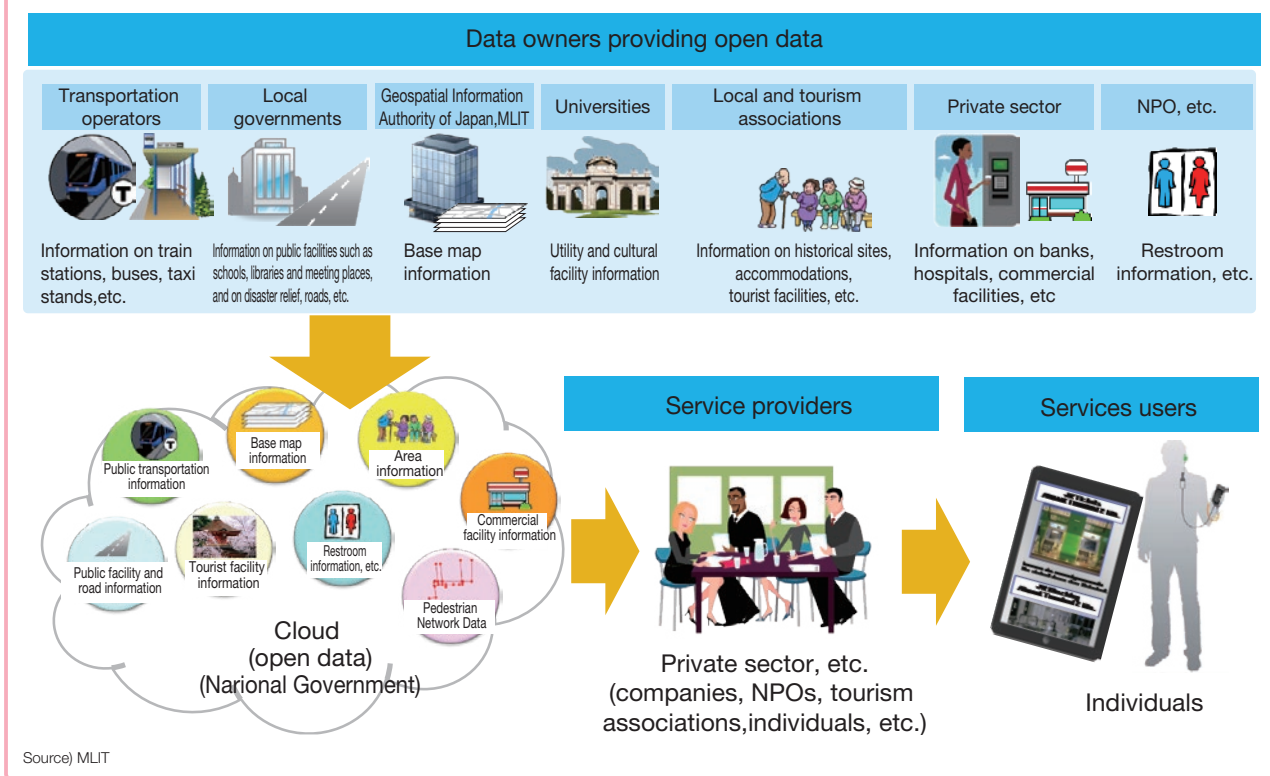
4 Promotion of the dissemination of pedestrian mobility support

It has been promoted that the dissemination of pedestrian mobility support service that utilizes ICT toward the establishment of a society where anyone including foreign visitors, elderly and physically-challenged people can participate in social activity freely and without stress.

The Study Committee for Promoting ICT-assisted Pedestrian Mobility Support (led by Prof. Ken Sakamura of the Graduate School of the University of Tokyo), which was established in June 2014, studied the requirements for full-scale promotion of pedestrian mobility support, and prepared proposal in April 2015. The proposal recommends that it be necessary to actively promote the concept of “open data” to disseminate the pedestrian mobility support service. Based on the proposal, “Data site for pedestrian mobility support service” has been set up in July 2015, In September 2015, “Guidelines for the approaches to pedestrian mobility support service that utilizes open data” to local governments” has been published.

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.

Figure II-7-1-3 Illustration of the establishment of services based on the use of open data



Section 2 Natural Disaster Measures

Japan's national land is subject to severe conditions in such terms as climate, geography, and geology. Such natural disasters as earthquakes, tsunamis, floods, and sediment-related disasters occur almost yearly. The year 2015 also saw a series of natural disasters occurring throughout the country, including the volcanic eruption on Kuchinoerabujima Island and torrential rains falling in the Kanto and Tohoku regions. The importance of natural disaster measures is more urgent than ever before because there is concern over water disasters that are occurring more frequently and to a heavier extent due to climate change as well as over the occurrence of giant earthquakes that are expected to strike, including the Nankai Trough Mega Earthquake and Tokyo Inland Earthquake. To this end, disaster prevention, disaster mitigation, and dilapidation measures must be fundamentally bolstered, and structural and non-structural measures are being taken to protect lives and living standards.

1 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.

An ideal way of engaging in disaster prevention and mitigation for the new stage basically entail the protection of human lives using facilities to deal with heavy rainfall and other forms of disasters that occur relatively frequently. In dealing with the extraordinarily heavy rainfall and other forms of disasters that occur rarely, the policy minimally aims to protect human lives and avoid catastrophic damage to society and the economy and seeks to deal with such contingencies primarily through non-structural measures. Specifically, it is believed that, (i) in order to protect lives, it is necessary to ensure that residents are able to evacuate autonomously and on their own initiative according to status updates on

precipitation amounts and other data points rather than just evacuate by way of an approach that involves waiting for evacuation instructions; and, (ii) in order to prevent catastrophic damage to society and the economy, a collective societal response is necessary, whereby worst-case scenarios are envisioned and the national and local governments, business operators, and other concerned parties all share a sense of impending crisis. Various initiatives are underway based on this understanding.

(2) Preventing and Mitigating Water Disasters

Large-scale water disasters caused by tropical cyclones or the like (for example, disasters caused by Typhoon Wipha visited Izu Oshima Island and other regions in Japan in 2013 and storm surge disasters caused by Hurricane Sandy in US in 2012) are 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 Malls, Subways, Etc., Working Group has summarized responses to issues concerning underground settings and disseminated this summary to the relevant organizations. Accordingly, flood measures have been applied on a coordinated basis to underground malls, subways, and connected buildings in the three major metropolitan areas.

The Disaster Action Plan Working Group provides support to enable the heads of municipalities to issue evacuation instructions at appropriate times and has formulated timelines focused on the issuance of evacuation instructions for rivers under the direct jurisdiction of the national government, as well as timelines for bringing together twenty organizations and thirty-seven departments and agencies, including local governments, railways, electricity power operators, telecommunications operators, and welfare facilities, in the downstream basin of the Arakawa River. Modeled on this approach, councils have been established for Ishikari River (Hokkaido), Kuma River (Kumamoto), and other blocks throughout the country to commence studies on timelines for bringing together many concerned parties.

In August 2015, the third Conference of the MLIT Headquarters for Disaster Prevention and Mitigation Measures In Connection With Water Disasters was held where it was decided that Regional Development Bureaus would primarily organize hearings to be attended by companies and other concerned parties in order to study the establishment of a Catastrophic Damage Prevention Working Group and initiatives that could be undertaken in collaboration with companies and other concerned parties. With the objective of minimally protecting lives and preventing catastrophic damage being caused to society and the economy in the context of an ideal way of engaging in disaster prevention and mitigation for the new stage as declared in January of the same year, this working group was established under the purview of the MLIT Headquarters for Disaster Prevention and Mitigation Measures In Connection With Water Disasters for the purpose of studying measures to prevent catastrophic damage caused to society and the economy in accordance with an indication of orientation as to the necessity of a collective societal response informed by a shared sense of crisis. The Kanto, Chubu, and Kinki Regional Development Bureaus have set up councils in different areas and have been conducting hearings attended by companies and studies of the projected impact of disasters in terms of damage.

(3) Responding to Climate Change

There are growing concerns about the intensified frequent occurrence of water disasters (river water flooding, inland water flooding, storm surges) and sediment-related disasters, droughts caused by natural hazards that exceed the capacity of facilities. In August 2015, a report was issued by the Infrastructure Development Council entitled “Approach to Climate Change Adaptations in the Field of Water-related Disasters”.

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

(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

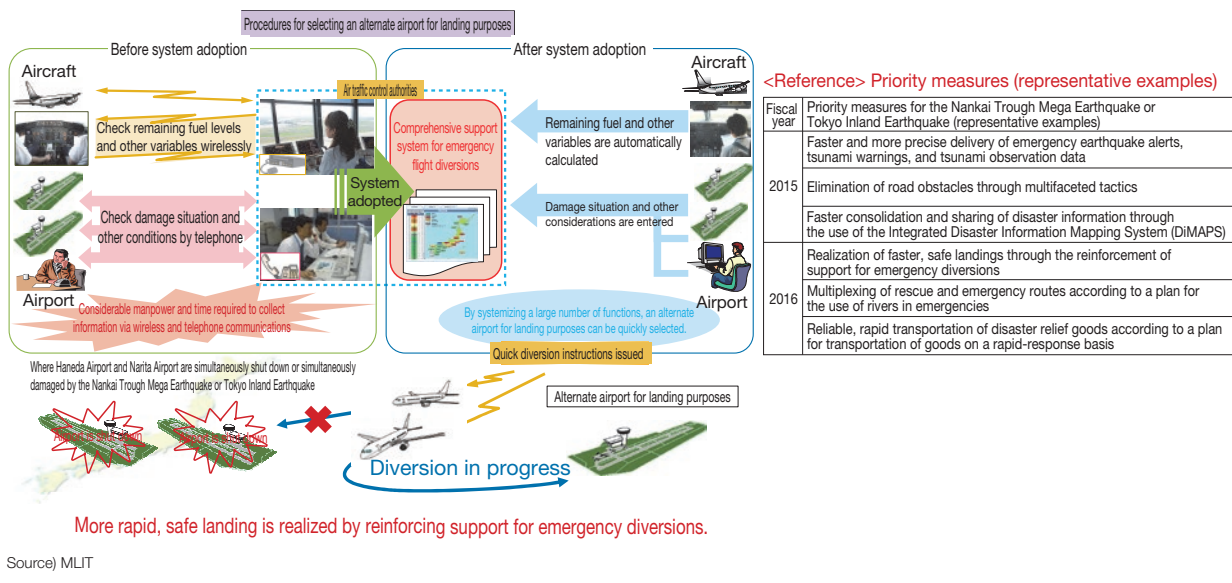
Kyushu will experience strong shaking with a seismic intensity of 6-7 and a huge tsunami will attack the wide Pacific-side coastal area within a short period of time. Deaths will reach a maximum of about 320,000 people, a critical situation including the interruption of transport infrastructure and paralysis 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 the development and management of a lot of infrastructures and the protection of human lives and properties at sea and which has many field agencies all over Japan—established the Ministry of Land, Infrastructure, Transport and Tourism Nankai Trough Mega Earthquake and Tokyo Inland Earthquake Response Headquarters and a Response Plan Making Working Group in 2013, and formulated the Ministry of Land, Infrastructure, Transport and Tourism Nankai Trough Mega Earthquake Response Plan and Ministry of Land, Infrastructure, Transport and Tourism Tokyo Inland Earthquake Response Plan on April 1, 2014, in order to determine the reality-based responses to be taken by collective effort. Regarding 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 of the same year and in August 2015, the Nankai Trough Mega Earthquake and Tokyo Inland Earthquake Response Headquarters determined the priority measures to be carried out after taking into account the status of the implementation of both response plans to date.

As a specific example of a priority measure for FY 2016, it was determined that, in order to implement the Tokyo Inland Earthquake Road Obstacle Elimination Plan formulated last fiscal year—in other words, in order to reinforce multidirectional strategies and secure transportation modes immediately after a disaster strikes, (i) an emergency river-utilization plan whereby rivers would be harnessed to facilitate the multiplexing of transport routes shall be formulated, (ii) a plan for the immediate and reliable transportation of relief goods after a disaster strikes shall be formulated, (iii) and a system for comprehensively supporting emergency flight diversions and transportation to enable any airplane to land at an alternate airport selected immediately in the event that the intended destination airport is shut down because of an earthquake shall be fully activated.

Figure II-7-2-1 Responding to the Nankai Trough Mega Earthquake or Tokyo Inland Earthquake



(5) Rebuilding Society to Raise Flood Prevention Awareness

(i) Damage from and the emergency response to torrential rains in the Kanto and Tohoku regions

Record levels of torrential rains falling in the Kanto and Tohoku regions in September 2015 caused the floodwalls along a stretch of approximately 200 meters of the Kinugawa River in Misakamachi, Joso-city, to collapse, resulting in flooding that submerged about forty square kilometers of land and the loss of the lives of two individuals in the drainage area. This massive disaster also necessitated the rescue of 4,300 local residents.

The MLIT provided Joso-city with information on the dangers of flooding and maps of the area expected to become submerged prior to the collapse of the levees. In addition, the regional office head provided information on the state of rivers to the mayor (via a hotline).

The MLIT dispatched a liaison officer (local contact person for disaster countermeasures) to the local affected governments of Joso-city and other nearby municipalities prior to the collapse of the levees to adjust channels of communications, dispatched TEC-FORCE (emergency disaster countermeasures detachment), conducted status surveys and drainage activities, and, on the day on which the levees collapsed, commenced the drainage of water, accepted up to fifty-one drainage pump trucks per day from across Japan, and proceeded to more or less remove flood waters completely from homes and public facilities over the next ten days. Emergency work to restore the collapsed levees commenced on the day of the collapse. A week later, provisional levees (embankments) were completed and the emergency restoration work was wrapped up in two weeks.

(ii) Emergency Actions to Induce Evacuations

In response to this flood, emergency actions to induce evacuations in response to the insecurities and concerns of municipal mayors and residents living near riverside levees nationwide were publicly announced on October 5, top-level seminars were held with municipal mayors, flood plain zones where houses are at risk of collapse if rivers were to overflow were publicly announced, and other initiatives were advanced for rivers under ministerial jurisdiction and areas alongside such rivers.

(iii) Vision for the Restructuring of Society to Raise Flood Prevention Awareness

This flood caused many houses to collapse or become washed away from the overflowing of rivers, as well as the flooding of wide areas for an extended period of time. Floods in recent years have seen unprecedented numbers of isolated persons emerge because of a combination of these factors and delayed evacuations. Climate change also gives rise to concerns that flooding that exceeds the capacity of such facilities to respond appropriately will occur with greater frequency.

Upon considering these circumstances, a Subcommittee to Study Flood Control Measures to Mitigate the Impact of Large-Scale Inundations was established under the purview of the Infrastructure Development Council to discuss ways of implementing flood-control measures in the future. On December 10, a report was issued in which the following was stated: “We believe that it is simply a matter of time before an incident of large-scale flooding which exceeds the capacity of the

facilities occurs; it is thus necessary to restructure society to ensure that there is awareness of the need to prevent floods.”

In accordance with this report, the MLIT determined that it would newly endeavor to restructure society into one that is aware of the need to prevent floods by FY 2020 based on a Vision for the Restructuring of Society to Raise Flood Prevention Awareness through initiatives carried out for all rivers under ministerial jurisdiction (109 water systems) and municipalities at risk of flooding from the overflowing of such rivers (numbering 730 in total). With respect to non-structural measures, efforts will be undertaken to transition to more effective non-structural measures to be implemented in accordance with the perspective of residents in order to enable residents to detect risks themselves and evacuate on their own accord. To illustrate, the transmission of push-type flood forecast notifications with smartphones will be progressively introduced beginning in the flood season of 2016. As for structural measures, we will steadily promote conventional structural measures to safely discharge flood flow in areas requiring upgrades on a priority basis, such as areas with significantly inadequate downstream capacity and areas with a history of water leakage. In addition, we will for now introduce structural measures for flood damage mitigation, including ideas for the construction of levees that can extend the time to collapse even in the event of an overflow, to be implemented in areas that have not yet undertaken levee upgrading on account of the need to strike a balance between upstream and downstream flows irrespective of the extent to which there is a considerable risk of an overflow.

For the Kinugawa River, where extensive damage was caused because of the recent flooding, emergency flood control measures integrating both structural and non-structural elements for the first time in the country will be implemented as part of the Kinugawa River Emergency Measures Project. In different regions, councils consisting of river administrators, prefectural governments, and municipalities will be newly established for the shared objective of mitigating disasters and in order to promote the aforementioned structural and non-structural measures on an integrated, systematic basis.

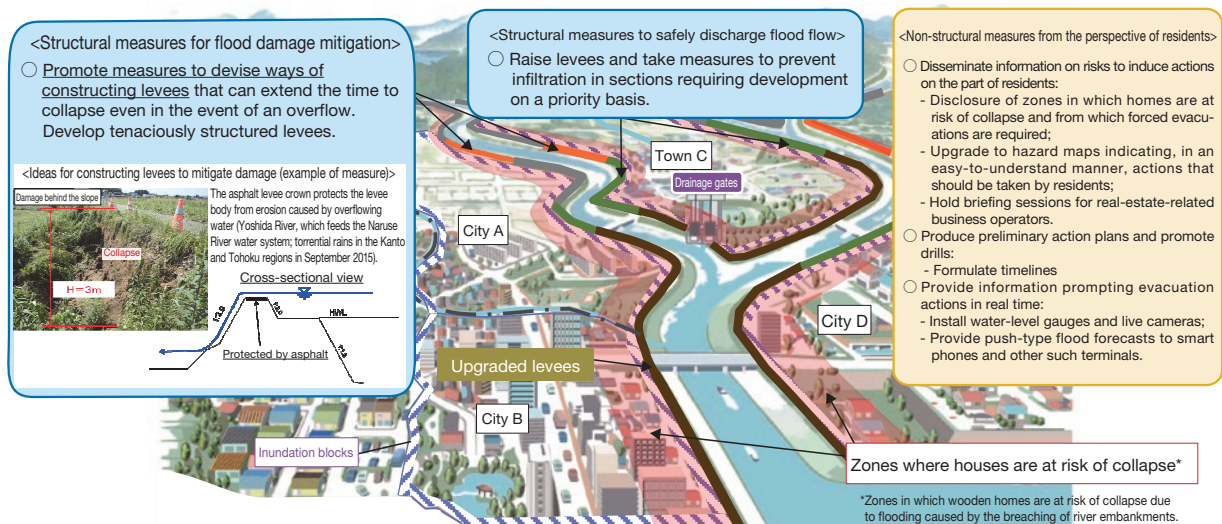
Figure II-7-2-2 Vision for the restructuring of society to raise flood prevention awareness

In response to torrential rains that fell in the Kanto and Tohoku regions, the restructuring of society to raise flood prevention awareness is to be newly incorporated into FY 2020 targets applicable to all rivers under ministerial jurisdiction and municipalities along such rivers (109 water systems, 730 municipalities) in accordance with a **Vision for the Restructuring of Society to Raise Flood Prevention Awareness**.

- <Non-structural measures> - Carry out a shift to more effective non-structural measures from the perspective of residents and implement these measures on a priority basis by the 2016 flood season in order to enable residents to detect risks themselves and evacuate autonomously.
- <Structural measures> - In addition to structural measures to safely channel off flood waters, adopt crisis management-type structural measures to mitigate damage in the event of inundation and implement these measures by FY 2020.

Key measures

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



Source) MLIT

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

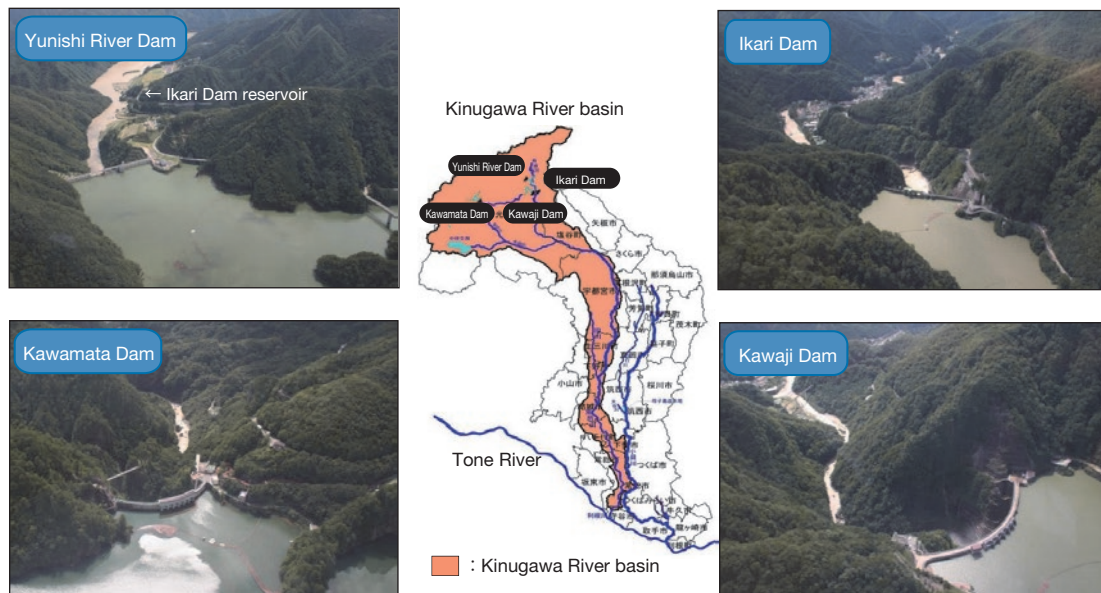
(1) Flood Measures

Many of Japan's major cities are positioned on low-lying districts that are lower than the river level during flooding,

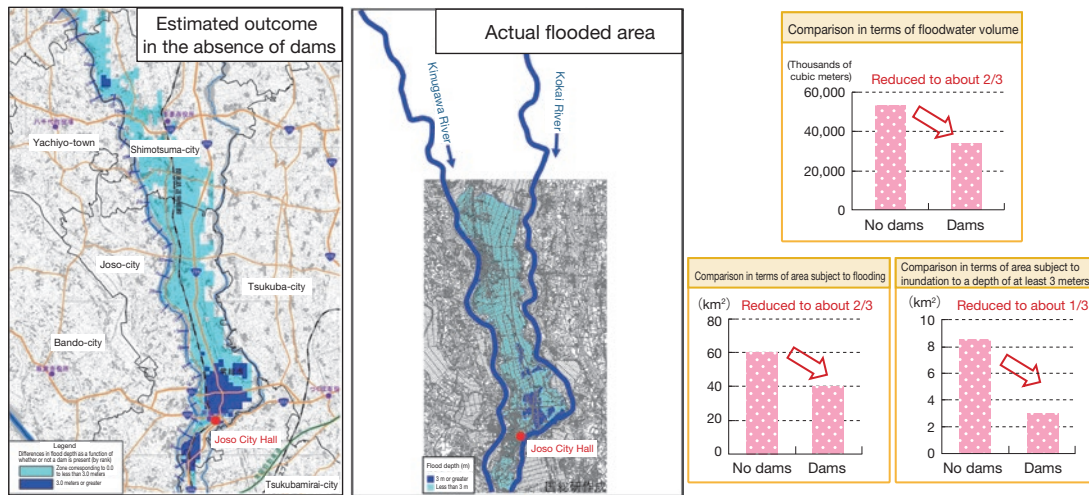
making the latent danger of flood inundation quite high. Water control measures, such as those involving the expansion of the river channel to safely flush away floods, embankments, the development of discharge channels, dams to temporarily hold back floods, and artificial ponds, have steadily improved the degree of water control safety. However, flooding occurred in various locations throughout the country in 2015, including the flooding that arose from the collapse of the embankments of the Kinugawa River from torrential rains in the Kanto and Tohoku regions. 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 incidents involving inundation and other forms of flooding that occurred in 2015, the value of flood control projects implemented previously was demonstrated. For example, flood control for approximately 100 million tons of water was carried out through four dams established in the upstream reaches of the Kinugawa River, as a result of which it is estimated that the water level corresponding to breach points shifted approximately twenty-five centimeters downwards, the volume of overflowing water was reduced by about two-thirds, and the overflow area shrank by around two-thirds (around 1/3 for the area where flood waters rose to a depth of three or more meters).

Figure II-7-2-3 Conditions and effects of upstream dams on the Kinugawa River during the torrential rains that fell in the Kanto/Tohoku regions



*These photographs of different dams were taken on September 11 from positions upstream from each dam.



*Based on simulation results.

Source) MLIT

(i) 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 disasters 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.

Column Technology development in upgrading dam projects ~The Mondzukuri Nippon Grand Award~

As a measure to use existing facilities, the dam project is required to further utilize existing stocks to deal with the increased frequency of heavy rain and the future climate changes. Therefore, upgrading dam projects are mainly focused on (i) the increase in capacities of existing dams by raising dam body, (ii) the improvement in flood control ability by reorganizing reservoir capacity, (iii) the improvement in discharging ability by constructing of new tunnel spillways, and (iv) permanent measures against sediment such as sediment bypass tunnels.

<Case examples of dam-regeneration>

① Increasing capacity

Increase the water-storage capacity by elevating the existing dam

Shin-Katsurazawa Dam
Elevated approx. 12 meters
Katsurazawa Dam
Shin-Katsurazawa Dam upon completion

② Securing capacity

Increase the capacity to modulate floodwaters by harnessing the capacity of water utilization

Capacity to modulate floodwaters
Capacity of water utilization
Capacity of sedimentation
Add discharge facilities
Increase the capacity to modulate floodwaters
Capacity of water utilization
Capacity of sedimentation
Add discharge facilities by cutting the dam body
Construction for a project to upgrade the Nagayasuguchi Dam

③ Increasing discharge capacity

Increase the discharge capacity by installing a tunnel spillway

Capacity to modulate floodwaters
Capacity of sedimentation
Tunnel flood spillway
Intake port
Discharge port
Construct new large cross-sectional water channel tunnel
Illustration of completed project to revamp the Kano River Dam

④ Maintaining dam functions

Upgrade measures to deal with sedimentation using a sediment bypass tunnel

Main dam
Offshoot weir
Sediment deposit weir
Test operations of the Miwa Dam sediment bypass tunnel
Sediment bypass tunnel

(Source) MLIT

<The Mondzukuri Nippon Grand Award / Prime Minister's Award>

Case outline

The floating-type temporary closure construction method is a construction method used in the redevelopment of a dam to upgrade the existing dam's flood-control functions whereby steel equipment that has been temporarily shut off is floated when dry space is secured while the dam remains operating. The equipment is then assembled on the surface and installed as a single unit at one time. This method precludes the need to engage in assembly work while submerged deep below the surface of the water. As the equipment that has been temporarily shut off can also be converted, significant cost savings can be achieved, the construction period can be shortened, and safety can be ensured. Overseas deployment is also possible.

Conventional method (seat type) **Floating method**

Seated concrete
Main dam structure
Holes is opened from downstream
Underwater work is reduced

State of installation under the floating-type temporary closure method

Award ceremony

(Source) Cabinet Public Relations Office

(Source) MLIT

Today in Japan, 20 or so projects are in progress, including (i) the embankment raising by approximately 12 meters for the existing Katsurazawa Dam, (ii) the modification to increase the capacity of flood control and add spillways by cutting out the dam body for the Nagayasuguchi Dam, (iii) the project to increase the capacity of flood control and newly construct a tunnel spillway for the Kanogawa Dam, and (iv) the project to newly construct a sediment bypass tunnel for the Miwa Dam.

Especially in the Tsuruta Dam redevelopment project, the floating cofferdam construction method has been developed as a technique for construction while operating the reservoir, in which temporary steel facilities are floated and constructed on the water, and then mounted onto the dam body in bulk. The method was recognized for cost reduction, shortening of construction periods, and safety realized by eliminating deep sea diving operations and diverting the cofferdam facilities to other purposes, and for the possibility of overseas development, so the Prime Minister's Award in the Monodzukuri Nippon Grand Award was granted to the engineers.

(ii) 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.

(iii) Flood Control Measures Tailored to River Basin Characteristics

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

(A) Comprehensive Flood Control Measures

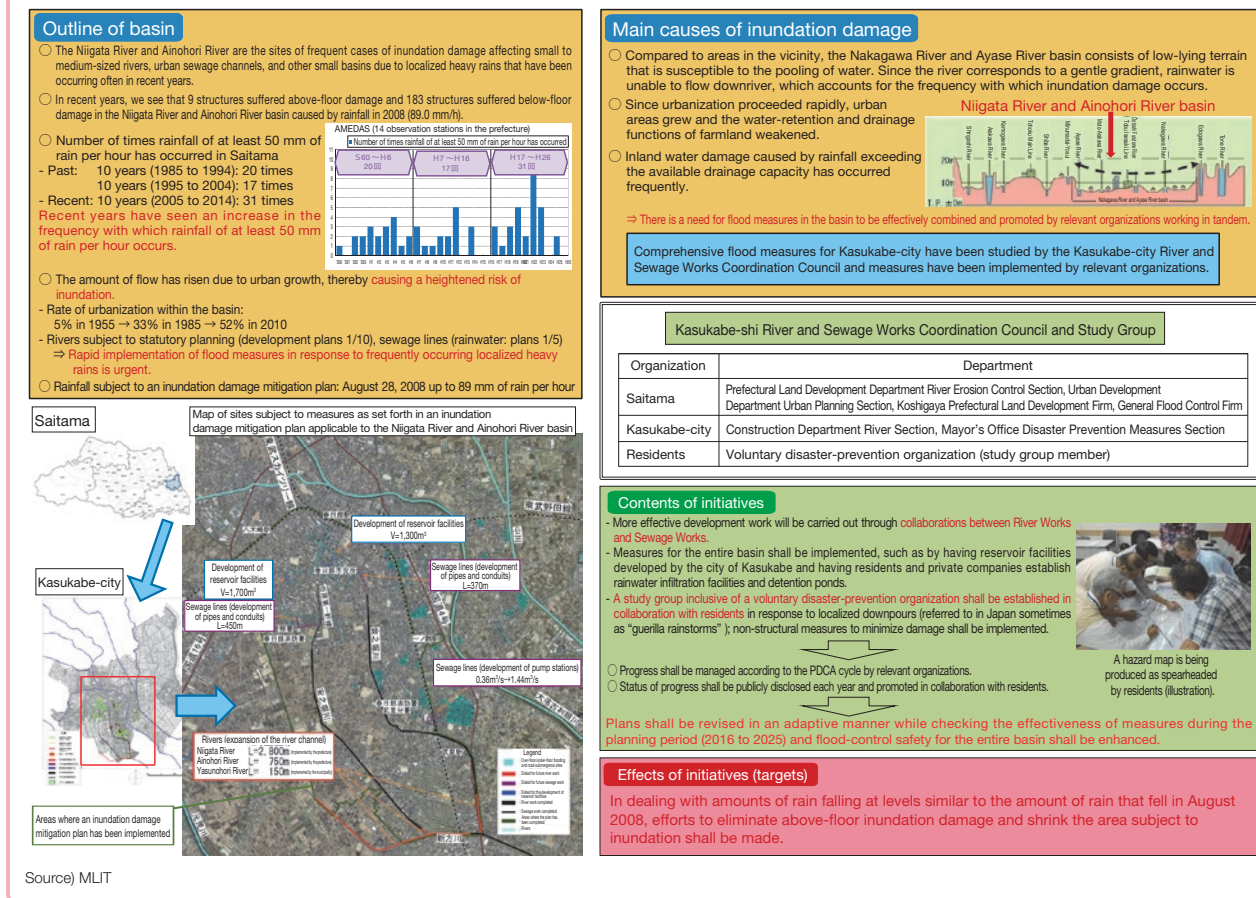
With factors, such as an increase in the impermeable land area following the development of urban areas and peripheral areas, as well as an increased discharge from flooding rivers, for urban rivers where flood control safety is significantly compromised, it is important to carry out comprehensive flood control measures, in addition to river development, such as securing the water retention and flood dissipation functions of the river basin, directing land use in regions at high risk of disasters occurring, and establishing a precautionary evacuation framework. As part of these efforts, 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 damage.

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

(B) Localized Downpours Measures

In recent years, due to 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 security plan" is registered and initiatives to promote mitigation measures against flood damages are being implemented in addition to the development of rivers and sewerage.

Figure II-7-2-4 Examples of measures based on a 100 mm/h security plan in Kasukabe-city, Saitama



(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 ^{Note} 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) Inland 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 inland water emergency measures are being utilized with the cooperation of relevant parties including regional authorities and affected residents to carry out structural measures such as proactively implement rainwater drainage reduction facilities; non-structural measures such as providing rainfall information, land use regulations, and creation of inland water hazard maps; and self-help initiatives such as the placement of water stops and sandbags as well as evacuation activities in combination for the promotion of integrated flood measures. In May 2015, the Flood Prevention Act was partially amended, and a system of areas that are expected to become submerged in connection with local runoff, a system of sewage lines tied to the public disclosure of water levels, a system of areas subject to measures to address inundation damage, and a system of public sewerage for dealing with rainwater have been established in order to further reinforce

Note A levee that surrounds districts with housing and other structures

our response to inundation damage in terms of both structural and non-structural elements.

(iv) Revising the Flood Prevention Act and the Sewerage Act

In recent years, we have seen many instances of inundation damage exceeding current expectations due to flooding, local runoff, and storm surges. There is thus a growing need to enhance and reinforce evacuation systems and other responses to such inundation damage.

In areas in front of train stations and other locations where urban functions are concentrated, additional improvements to sewerage systems are difficult to carry out because of the congestion of underground space and other factors and it is required to promote flood measures with the corporation of private sectors.

In light of these issues, the Flood Prevention Act and Sewerage Act were amended in May 2015.

These amendments called for the establishment of a system of areas that are expected to become submerged in connection with conceivable maximum-scale flooding, local runoff, and storm surges; the establishment of a system of publicizing water levels corresponding to runoff and storm surges; the establishment of a system of areas subject to measures to address inundation damage; and cooperative measures for dealing with flood prevention as undertaken by sewage works administrators.

(v) Strengthening the Flood Prevention Framework

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

In order to reinforce the ability of local areas to prevent floods with the participation of various key players, we are also supporting initiatives tied to plans for the securing of voluntary evacuations and the prevention of inundation in underground malls (including those slated to be constructed and those that are under construction) situated in areas expected to become submerged, facilities for people with special needs, and large-scale factories. With respect to underground malls, we are promoting initiatives for the production of plans for the securing of voluntary evacuations and the prevention of inundation jointly with adjacent facilities into which water is expected to infiltrate and through which users are expected to evacuate.

(vi) Publicizing Forecasts and Warnings of Flooding and Providing River Information

The Minister of Land, Infrastructure, Transport and Tourism or the Prefectural Governor designate rivers with large river basins that are at risk of causing great damage to the nation's economy or other great losses as flood forecast rivers and issue flood forecasts indicating the water level or flood volume jointly with the Director-General of the Japan Meteorological Agency. Also, aside from flood forecast rivers, important 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 of flood), 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 website "River Disaster Prevention Information (Kawa Boh) ^{Note 1}" 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 2016, 51 broadcast stations nationwide are providing such services. In observing rainfall levels, conventional radar rain gauges (C-band radar) and a ground-observation network, as well as the XRAIN network (MLIT X-band MP radar network) ^{Note 2}, which is capable of observing local rainfall patterns virtually in real time in order to help facilitate appropriate river management and disaster-

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.

prevention activities in response to flood damage and landslides caused by concentrated downpours and localized heavy rainfall that are becoming increasingly frequent in recent years, are being developed. Rainfall information is also available on the Internet, and an observation system consisting of 38 radars was established as of the end of March 2016.

(vii) Designation of Areas that are Expected to Become Flooded and Submerged

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

In order to provide support for the production of hazard maps for the benefit of users that are directly tied to more effective evacuation actions in municipalities included in areas that are expected to become flooded and submerged, we will revise procedures for the production of hazard maps based on discussions carried out at meetings of expert panels that were held in FY 2015 as well as provide support tools to simplify the production of hazard maps and technical support for dissemination and utilization.

Areas expected to become flooded and submerged have been designated and publicly disclosed for approximately ninety-seven percent ^{Note} of flood-forecasted rivers and rivers for which water levels are publicly disclosed. Flood hazard maps have been produced for approximately ninety-eight percent ^{Note} of municipalities included in areas that are expected to become submerged.

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 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.

(viii) 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 advancing. Also, for river infrastructure, migration to condition-based maintenance is being implemented where degradation conditions are monitored through inspections so that measures are taken at appropriate moments to as move to extending facility life cycles and renewal in a planned manner. In addition, the Priority Plan for Social Infrastructure Development states that major river infrastructure administered by the nation will have lifetime extension plans by FY 2016. 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.

(ix) Measures Against Illegally Moored Vessels in Rivers

Since illegally moored vessels in rivers can impede flood control measures (such as by impeding river construction work, blocking the downstream flow during flooding, and damaging river management facilities) and otherwise impede the management of rivers (such as by causing water pollution through the leakage of fuel and impeding river usage), river

Note As of the end of March 2015.

administrators are providing guidance on the lawful mooring of unlawfully moored vessels and on the relocation of unlawfully moored vessels to proper storage facilities and otherwise working to remove unlawfully moored vessels.

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

(x) 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 ^{Note}, are promoted.

(xi) Developing Hills Using Construction-Generated Soil

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

Column

Start of construction work to heighten the ground level in zero meter areas utilizing construction generated soil

On the Koto delta in Tokyo, a large zero meter area expands, and the residents are living on the land lower than the water surface. When Typhoon Kathleen struck the area in 1953, the houses in front of Shinkoiwa Station on the Sobu Line flooded to the eaves (Photo 1), and water did not subside for several weeks. A person said that they had to live on the roofs for three weeks at that time. Today, as many as 2.5 million people are living in the area as the result of advancement in land use, so if a serious flood occurs, it is expected that many people would fail to escape and enormous damage would be inflicted.

For residents in such zero meter areas, the heightening of the ground level is an earnest wish. In the meantime, land to dispose of construction generated soils is insufficient in the Tokyo metropolitan area, which is an urgent issue for relevant enterprises.

Thus, a system has been established, in which the government temporarily provides its owned land such as parks, and enterprises that generate soils through construction work make embankments with the soils and restore the original forms.

This is a win-win business because, for the government side, higher ground that can be used as evacuation places is constructed without its cost burden, and, for the enterprises generating soils, the soils can be disposed of.

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

As the first project using the new system, the ground level is to be heightened in Shinkoiwa Park controlled by Katsushika Ward (Photo 2). Following the public invitation, the partner enterprises in the construction will be selected in July 2016. After the selection, the ward and the partner enterprises will have consultations to start the construction work scheduled by next spring or later.

It is expected that the first project will trigger more ground-raising construction work with effective use of construction generated soils, which will contribute to protection against disaster and higher safety in zero meter areas.

Photo 1: Katsushika-ku experiences flooding up to the eaves of houses during Typhoon Kathleen.



Source) MLIT

Photo 2: Shinkoiwa Park in Katsushika-ku is elevated.



(2) Countermeasures against Sediment-related Disasters

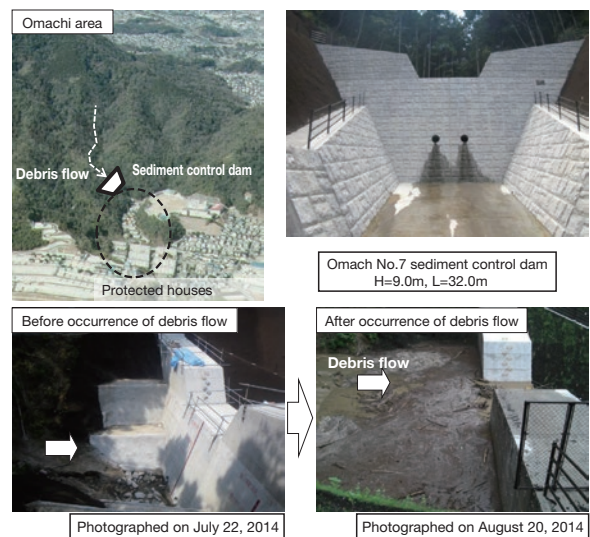
Japan has a steep geography and vulnerable geology over a wide area. In addition, Japan has a low number of plains and development of residential land has extended to hills and piedmont slopes along with the development of economy as well as the increase in population. As a result, there are about 520,000 areas vulnerable 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 2006 to 2015). In 2015, there were 788 cases, causing great damages such as 2 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 76 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, the MLIT has been carrying out development work on sediment-control dams and other such facilities through specific emergency sediment-control facility projects since FY 2015.

Figure II-7-2-5

Effect of Sediment Control Dams against Heavy Rain in August 2014



Source) MLIT

Figure II-7-2-6 Status of the implementation of the construction of sediment control facilities in stricken areas



Source) MLIT

Column Sediment-related disasters caused by Kanto-Tohoku Heavy Rainfall in September, 2015

Torrential rain triggered by the season's 17th and 18th typhoons caused 177 sediment-related disasters in 17 prefectures around the nation. In Hiyoshi-town of Kanuma-city, Tochigi, a slope behind a house collapsed, causing one death and other damage. In the Serisawa District of Nikko-city, Tochigi, debris flows occurred in nine places in eight mountain streams, inflicting damage, such as seven totally or partially destroyed houses, and the split of the city road Serisawa-sen, which was the only evacuation route, temporarily isolated 25 residents.

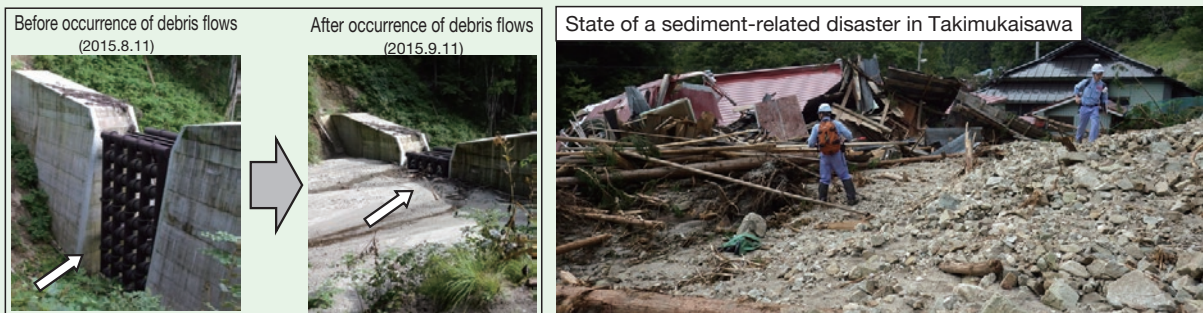
In the same district, Takimukaisawa suffered serious damage, including totally destroyed residences. In the meantime, in Tamosawa where two sediment control dams had already been provided, the dams fully captured sediment and driftwood, preventing any damage to settlements downstream.

○ Position map



Source) MLIT

○ Effectiveness of sediment control dams



Source) MLIT

Directly after the disaster, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) removed overflowing sediment, contributing to early resolution of isolated settlements, and then provided new sediment control dams and other facilities to mountain stream areas that were seriously destroyed by debris flows.

In addition, MLIT conducted an aerial survey to confirm the damage status by helicopter, and researched mountain streams with specialists in sediment-related disasters. MLIT reported the research results and offered advices on the alert and evacuation system to the Mayor of Nikko.

(i) Fundamental Countermeasures against Sediment-related Disasters

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

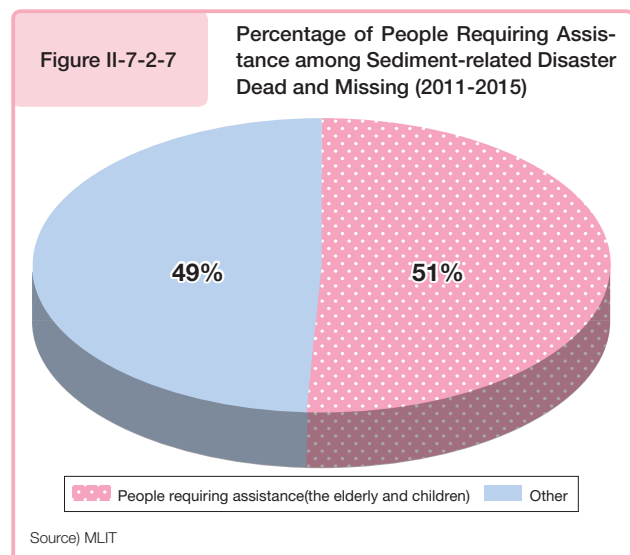
(ii) Emergency Countermeasures against Sediment-related Disasters in Sediment Disaster Affected Areas

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

(iii) Countermeasures against Sediment-related Disasters to Protect Those Requiring Assistance during Disasters

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

In accordance with the Act for Promotion of Measures to Prevent Sediment Disasters in Sediment Disaster Alert Areas, etc., (Sediment Disaster Prevention Act), measures combining structural and non-structural elements are being promoted, such as by restricting development pertaining to facilities used by persons with special needs and stipulating the names and addresses of facilities used by persons with special needs in sediment-related disaster hazard areas and matters relating to the transmission of information on sediment-related disasters in municipal plans for the prevention of local disasters.



(iv) Countermeasures against Sediment-related Disasters for Urban Areas Near Mountain Base Slopes

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

(v) Countermeasures against sediment-related disasters for Slopes Near Roads

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

(vi) Countermeasures against Sediment-related Disasters to promote Regional Disaster Prevention

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

(vii) 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.

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

(B) Prompting the Relocation of Housing at Risk

Houses near cliffs vulnerable to slope failures are prompted to relocate using the program for relocating at-risk housing located near cliffs. In FY 2015, this program decreased risky houses by 29 and 16 new houses were built to replace risky houses.

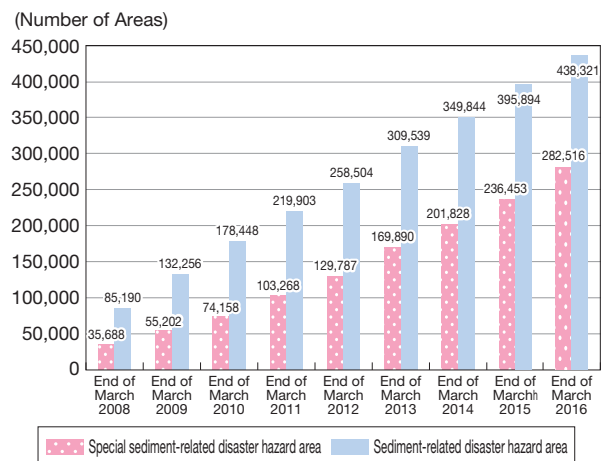
(viii) Countermeasures for Large Scale Sediment-related Disasters

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

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

Figure II-7-2-8

Designated Sediment-related Disaster Hazard Areas Nationwide (end of the March, 2015)



*Estimated total number of sediment-related disaster hazard areas nationwide: 651,320

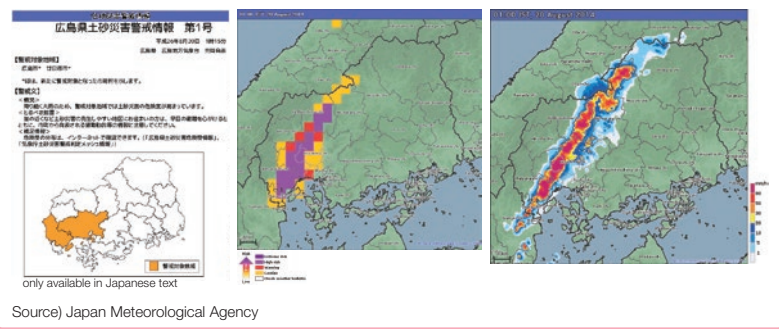
Source) MLIT

(ix) Issuing Sediment Disaster Alert

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

Figure II-7-2-9

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



(3) Volcanic Disaster Countermeasures

(i) Countermeasures for Sediment-related Disasters Following Volcanic Activity

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

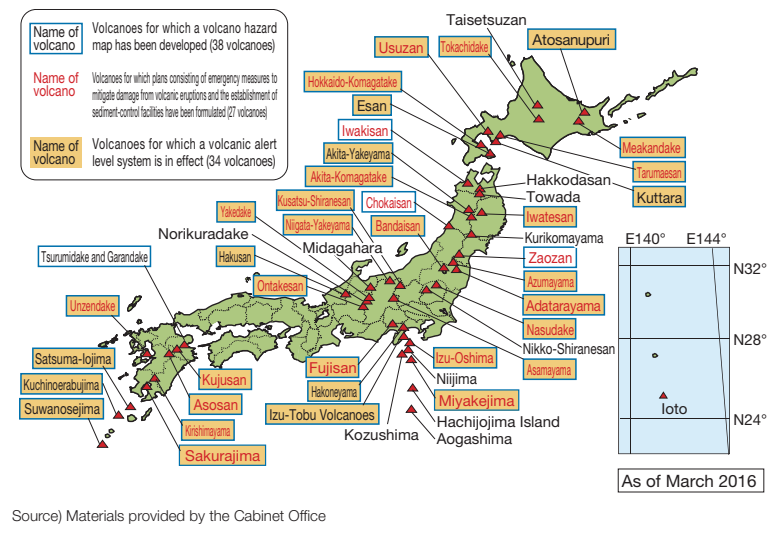
Sediment-related disasters following volcanic eruptions could lead to large-scale disasters. In addition, it is very difficult to predict the position or scale of the eruption with good accuracy beforehand, causing serious damage. For this reason, a sediment-control plan for the emergency mitigation of the effects of a volcanic eruption is being formulated in order to mitigate damage through agile responses to volcanic conditions in combination with the development of facilities in advance; this plan targets forty-nine volcanoes that exhibit active volcanic activity and that are at risk of causing sediment-related disasters in the wake of an eruption.

The amended Active Volcanoes Act came into force in December 2015 and prefectural governments, Regional Development Bureaus, and other sediment-control departments, as members of the Volcanic Disaster-Prevention Council, decided that they would study volcano hazard maps from the standpoint of sediment-related disasters caused by eruptions. Thus, by developing volcanic sediment-control hazard maps (volcanic hazard maps that relate to sediment-related disasters), support was provided for a series of studies on alerts and evacuation systems by the Volcanic Disaster-Prevention Council.

In response to the eruption of Kuchinoerabujima in May 2015, a survey of conditions conducted by helicopter revealed that small debris flows were being generated in Mukaehama River; relevant information was provided to the relevant local authorities. Surveys have also been conducted to ascertain local conditions, such as in terms of ash fall deposit, in and around Asosan (Mt. Aso), Hakoneyama (Mt. Hakone), Asamayama (Mt. Asama), and other such volcanoes that either

Figure II-7-2-10

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



erupted or otherwise exhibited volcanic activity in 2015. Once again, relevant information was provided to the relevant local authorities.

(ii) Measures Against Ash Falling due to Active Volcanoes

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

(iii) Japan Meteorological Agency Initiatives

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

Also, Volcanic Alert Levels are being applied and improved through coordination of evacuation planning at local Volcanic Disaster Mitigation Councils (applied to thirty-four volcanoes as of the end of March 2016).

In accordance with recommendations (March 2015) issued at an investigative meeting of the Coordinating Committee for Prediction of Volcanic Eruption held in response to the disaster caused by the eruption of Ontakesan (Mt. Ontake) in September 2014, the Japan Meteorological Agency (JMA) commenced the issuance of “Details of Volcanic Activity”, which was clearly identified as being provisional in nature, and “Eruption Notice” designed to promptly report the fact of an eruption in progress, changed references to the key phrase “Normal” corresponding to Volcanic Forecasts and Volcanic Alert Level 1 to “Potential for increased activity,” and have otherwise been promoting improvements to volcanic information. In addition, JMA has sought to reinforce the system of volcanic observations and monitoring, such as by constructing new volcanic observation facilities.

Column

Major volcanic activities in 2015, and responses by the Japan Meteorological Agency

Looking back on 2015, there were intensified volcanic activities on Kuchinoerabujima, Hakoneyama (Mt. Hakone), Asosan (Mt. Aso), etc. This column describes the statuses of these volcanic activities and how the Japan Meteorological Agency (JMA) responded to them.

○Kuchinoerabujima

On Kuchinoerabujima, an explosive eruption occurred at 9:59 a.m., on May 29. JMA issued a Volcanic Warning at 10:07 a.m. on the same day, and raised the Volcanic Alert Level from 3 (Do not approach the volcano) to 5 (Evacuate) for the first time since the application of the Volcanic Alert Level. Following this, Yakushima-town officially issued an evacuation directive, and all residents in Kuchinoerabujima fled to the outside of island.

At the end of March, JMA stationed its staff on the island, who explained the results of field studies by the JMA Mobile Observation Team (JMA-MOT) and the volcanic activity status to the residents. After the eruption, the staff remained on Yakushima island and provided support related to the access to the island, such as explanations of the volcanic status, etc. They also installed more volcanic observation equipment such as seismometers and low-frequency microphones.

May 29, 2015
Kuchinoerabujima Island
Eruption (as taken with a distant camera in
Motomura-Nishi)



Source) Japan Meteorological Agency

Note This program will eventually encompass fifty volcanoes, including Hakkodasan (Mt. Hakkoda), Towada, and Midagahara.

On October 21, JMA, while maintaining the Volcanic Alert Level 5, issued a Volcanic Warning to limit the area where strict alerts are necessary to about the 2 km range from Shindake Crater and to 2.5 km range on the west side. Following this, Yakushima-town lifted the evacuation directive, except some districts on Kuchinoerabujima, on December 25, and the refugee residents returned to the island.

○Hakoneyama (Mt. Hakone)

Around Owakudani, volcanic activity intensified at the end of April. As the possibility increased of a small-scale eruption that would affect the surroundings, JMA issued a Near-crater Warning at 6:00 a.m. on May 6 and raised the Volcanic Alert Level to 2 (Do not approach the crater).

After that, since a very small-scale eruption was observed on Owakudani on June 30, JMA issued a Near-crater Warning at 12:30 p.m., and raised the Volcanic Alert Level from 2 to 3 (Do not approach the volcano). On June 30, JMA stationed its staff in Hakone-town, and they conducted field studies and explained the status of the volcanic activity to the town.

Later, as the volcanic activity subsided, JMA issued a Near-crater Warning on September 11, downgrading the Volcanic Alert Level from 3 to 2, and then lifted the Volcanic Warning on November 20, bringing the Volcanic Alert Level down to 1 (Potential for increased activity).

○Asosan (Mt. Aso)

On Asosan, a small-scale eruption occurred in the Nakadake No.1 Crater at 9:43 a.m. on September 14. Following the eruption, JMA issued Eruption Notice at 9:50 a.m. and issued a Near-crater Warning at 10:10 a.m., which raised the Volcanic Alert Level from 2 to 3. It was the first time for JMA to issue the Eruption Notice since the operation of the notice system on August 4.

Afterward, since the volcanic activity abated, JMA issued a Near-crater Warning at 2:00 p.m. on November 24, downgrading the Volcanic Alert Level from 3 to 2.

Response by the Meteorological Agency



Source) Japan Meteorological Agency

(iv) Japan Coast Guard Initiatives

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

With respect to Nishinoshima Volcano, for which two years had passed since it began erupting in November 2013, ocean surveys around the island were conducted in June and July 2015 using survey vessels for the first time since the eruptions began. These surveys revealed changes in the seafloor topography caused by the eruptions. The area of the island increased to approximately 2.6 square kilometers as of March 2016 (inclusive of the former Nishinoshima). Monitoring of volcanic activity and the changing conditions on the island using aircraft is ongoing.

(v) Geospatial Information Authority of Japan Initiatives
 (A) Improved Observation and Monitoring of Volcanic Activities

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

(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 activities by analysis of the abovementioned observation data.

(4) Storm Surge and Coastal Erosion Measures

(i) Promoting Storm Surge and High Wave Measures

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

(ii) Promoting Coastal Erosion Measures

Since a variety of factors contribute to coastal erosion across the nation, the administrators of rivers, coasts, shipping ports, and fishing ports are coordinating to implement measures such as sand bypasses [Note 2](#) and sand recycling [Note 3](#).

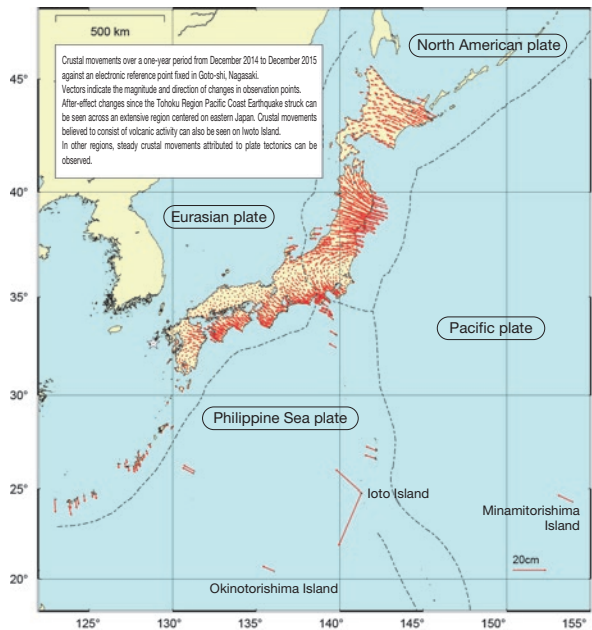
(iii) Providing Disaster Prevention Information Regarding Storm Surges

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

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

Figure II-7-2-11

Movements of Japan Archipelago Captured by Continuous Observation with GNSS



Source) Geospatial Information Authority of Japan

Note 1 Technology that monitors ground surface deformation from artificial satellites in space.

Note 2 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 3 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.

(5) Tsunami Measures

(i) Promoting Tsunami Measures

In preparation for the large scale tsunami disasters created by earthquakes, such as the massive earthquake that 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 inundation projections, designating warning areas, and drafting evacuation plans.

For the tsunami measures for coasts, structural measures are taken to develop coastal levees and so on necessary for resisting tsunami with relatively high frequency of occurrence, take earthquake and liquefaction measures, enable automatic/remote operation of floodgates, and develop coastal levees and seawalls with a tenacious structure that includes various structures, such as green coastal levees, in addition to non-structural measures taken to assist creation of tsunami and storm surges hazard maps and manage and operate floodgates and others effectively. In light of the fact that many operators of floodgates lost their lives during the Great East Japan Earthquake, the formulation of operating rules relating to floodgates shall be mandated. Studies have also been conducted by the Investigative Committee for the Promotion of the Safe and Appropriate Management and Operations of Floodgates and Land Locks since December 2015 for the construction of a system for safe and appropriate management and operations.

For 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. 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 that exceeds the tsunami with a relatively high frequency of occurrence.

Also, specified ports (86 ports) under the Act on Port Regulations have established Councils on Tsunami Measures for Ships to further improve tsunami measures for ships at each of the ports with the cooperation of relevant organizations.

With respect to tsunami measures applicable to rivers, the bulking up of river embankments, quakeproofing, and liquefaction measures are being advanced in areas at significant risk of flooding from a tsunami in order to prepare for the imminent arrival of a massive earthquake or tsunami.

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

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

For the tsunami measures of railways, the conditions of evacuation guidance when tsunamis occurred after the Great East Japan Earthquake are being inspected and fundamental thinking for evacuation (speedy evacuation is the most effective and important measure, etc.) for the largest scale tsunamis following something like 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.

(ii) 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 in March 2013, in which, for example, the word of “huge” for Major Tsunami Warnings was introduced as an expression of estimated tsunami height in the case of large earthquakes with magnitude 8 or more to emphasize that it is an emergency situation.

As of the end of March 2016, JMA monitors tsunamis with 38 Ocean-bottom tsunami meters, 18 GPS wave gauges, and 173 coastal tsunami gauges for issuance of tsunami information and update of tsunami warnings/advisories.

To facilitate tsunami measures for vessels, the Japan Coast Guard creates and publishes a tsunami disaster prevention information map (65 maps) depicting the expected behavior of tsunamis in port areas based on new assessments of the massive earthquake that occurs along the Nankai Trough (Cabinet Office, August 2012).

(iii) Tsunami Evacuation Measures

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

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 Private Urban Organization is assisting private enterprises in developing distribution facilities with a function of evacuating from tsunami and other disasters.

(iv) 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.

(v) Tsunami Measures for Government Facilities

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

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

(6) Earthquake Measures

(i) Improving the Earthquake Resistance and Safety of Housing and Architecture

Based on the amended Act on Promotion of Seismic Retrofitting of Buildings that went into effect in November 2013 to achieve goals of making at least 95 percent of housing and architecture used by many people earthquake-resistant by 2020, the reporting of earthquake-resistance diagnosis results for large-scale architectural structures and others used by an unspecified number of people has been mandatory, and the creation of display requirements for the earthquake-resistance has been implemented among other measures in its aim to promote earthquake-resistance.

Regarding the earthquake proofing of housing and buildings, Social Capital Development Integrated Grant and other measures are implemented for support but from FY 2013, for architectural structures requiring mandatory seismic diagnosis, intensive and emergency assistance is being implemented in addition to usual subsidies.

(ii) Promoting the Earthquake Resistance of Housing Land

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

(iii) Implementing Danger Assessments for Housing Land in Disaster Stricken Areas

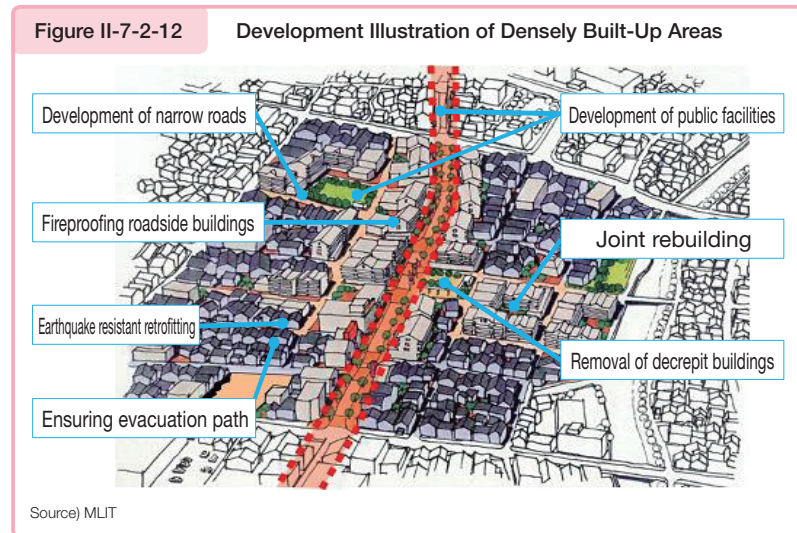
To prevent secondary disasters and ensure the safety of residents, frameworks are being developed in cooperation with

the Disaster Stricken Housing Land Danger Assessment Liaison Council consisting of prefectures and designated cities to evaluate the degree of danger of housing land swiftly and accurately after disaster strikes.

(iv) Development to Improve Densely Built-Up Areas

Development activity to rapidly improve densely built-up areas that are problematic in terms of disaster prevention and the residential environment is a pressing matter to be generally resolved by ensuring a minimum level of safety for densely built-up areas that are highly vulnerable in the event of an earthquake (approximately 4,435 hectares) by FY 2020.

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



(v) Securing Open Space

To improve disaster prevention functions and strive for safer and more comfortable town buildings, the development of disaster prevention parks is being promoted to serve as the center of restoration and reconstruction when earthquake disasters occur, center of disaster prevention as a relay hub for supplies, and as an evacuation area to protect the lives of evacuees from urban fires. A project for developing disaster-prevention parks and urban areas is being carried out to develop and upgrade disaster-prevention parks and urban areas in an integrated manner.

(vi) Promoting Construction and Improvement of Government Buildings as Disaster Prevention Centers

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.

(vii) Improving the Earthquake Resistance of Public Works facilities

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

For coastal works, earthquake resistance measures are promoted taking into account facility functions, degrees of importance of areas behind levees and other factors to prevent large-scale submergence of zero-meter areas due to damage to levees caused by earthquakes and to prevent the functions of levees and other protective facilities from being impaired before arrival of tsunamis when earthquakes such as 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 to important roads, such as emergency transport roads. In seeking to eliminate utility poles, according to the amendment of Road Act and other acts on June 2013, a system to enable road administrators to ban and restrict exclusive use and a system to enable the national government to provide interest-free loans to power-cable

administrators through local governments have been created for emergency transport roads and other roads that are important for disaster-prevention purposes.

With respect to projects concerning ports and harbors, we are endeavoring to increase the quake and tsunami resistance of port facilities and fortify industrial ports and harbors constituting locations within domestic and overseas wide-area networks according to the level of disaster imminence and the importance of the given port functions in order to ensure a socioeconomic system that remains workable, improve the competitiveness of our country, and earn international trust as we prepare for an earthquake occurring along the Nankai Trough, an inland earthquake originating immediately below Tokyo, or any other disaster expected to give rise to considerable damage.

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

For railway works, in preparation for 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 will be steadily implemented to avoid and reduce damage 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 that aims to minimize damage in anticipation of disasters striking are being combined for the promotion of integrated earthquake measures.

(viii) Countermeasures against Sediment-related disasters to Large-Scale Earthquakes

In preparation for large-scale earthquakes such as the Nankai Trough Mega Earthquake, implementation of effective sediment-related disaster countermeasures with combination of structural and non-structural measures are being promoted for the areas at risk of sediment-related disasters where important facilities and important transportation networks will be damaged and communities will be isolated by the landslides.

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

(ix) Japan Meteorological Agency Initiatives

To prevent and mitigate disasters caused by earthquakes, 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 on a 24-hour basis to provide Earthquake Early Warnings, earthquake information, and information on the Tokai Earthquake as swiftly and accurately as possible.

With respect to Earthquake Early Warnings, the Japan Meteorological Agency is developing the calculation system software with a view to introducing techniques to precisely estimate the epicenters of earthquakes even when multiple earthquakes strike at the same time and techniques to forecast ground motion appropriately even for a significantly large earthquake for which ground motion forecasting is difficult by the current method. In order to improve the precision with which the epicenter of an earthquake is pinpointed and increase the rapidity with which information can be released, the use of data provided by seismometers installed in sea areas and deep underground by relevant organizations began at the end of FY 2014. The use of land and submarine-based seismometers by relevant organizations will continue to be promoted.

With regard to long-period ground motion, information on observation of long-period ground motion is being issued on a trial basis from March 2013 to provide useful information that will contribute to the initial response immediately after the earthquake, such as the early detection of human and fixture damage. In addition, studies are being conducted to provide a forecast of long-period ground motion.

(x) Japan Coast Guard Initiatives

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

(xi) Geospatial Information Authority of Japan Initiatives**(A) Observing Crustal Movements and Strengthening Monitoring Frameworks**

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

(B) Research on Natural Disasters Resulting From Earthquakes

From the results of geodetic observations, such as GNSS, SAR interferometry and geodetic leveling, the mechanism of earthquake occurrence is being elucidated and research is being conducted to improve observations and analysis. We are engaging in research and development work and trial operations as concerns the rapid provision of information during disasters through analytical processes that combine basic geospatial information corresponding to Japanese territory and earthquake intensity. Additionally, for exchanging information on surveys, observations and research outcomes regarding earthquake prediction between relevant government organizations and universities, as well as to conduct academic deliberations based on this, the Coordinating Committee for Earthquake Prediction is operated. Moreover and for research on crustal movements, the Coastal Movements Data Center is being operated in order to gather, archive, and provide tidal records observed by relevant government organizations.

(xii) Measures for Stranded Commuters

If a major earthquake were to strike a major metropolitan area, it is expected that urban functions would become paralyzed and that there would be more stranded commuters than there were in the wake of the Great East Japan Earthquake. Thus, in order to ensure the safety of people in areas where there is a concentration of people and urban functions, a system based on plans for promoting urban regeneration and ensuring safety was established in 2012. In areas subject to urban regeneration and emergency development measures (sixty-three areas nationwide as of the end of March 2016), efforts are being undertaken to improve urban disaster preparedness through public-private partnerships by way of the production of plans for promoting urban regeneration and ensuring safety, the conclusion of agreements concerning facilities for promoting urban regeneration and ensuring safety, and the easing of various regulatory constraints. Comprehensive support for the production of plans for promoting urban regeneration and ensuring safety and for both structural and non-structural elements based on such plans is being provided through projects for ensuring and promoting urban safety for which areas around key stations are also regarded as areas subject to aid. Special measures concerning the imposition of taxes have also been taken for stockpiling warehouses mentioned in plans for promoting urban regeneration and ensuring safety.

(xiii) Ensuring Operational-Continuity Functions In the Event of a Disaster

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

In order to address these vulnerabilities in our cities, a project for the urgent promotion of the development of operational-continuity zones in case of disaster was established in FY 2015. We are accordingly promoting the development of area-wide energy networks to ensure operational continuity during disasters.

(xiv) 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

(i) Securing Winter Road Transportation (Snow and Cold Weather Works)

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

(ii) Avalanche Disaster Measures in Heavy Snowfall Regions

In Japan, 21,000 areas are prone to snow avalanche and the development of avalanche prevention facilities is being promoted to protect human lives from avalanche disasters in settlements.

(iii) 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.

(8) Sophistication of Disaster Prevention Information

(i) Aggregation of Disaster Prevention Information

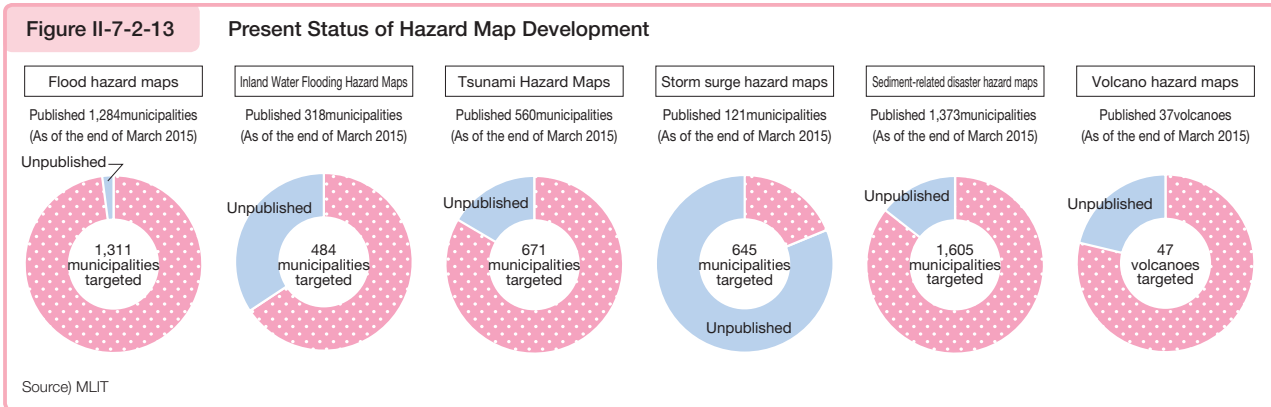
The “MLIT Disaster Prevent Information Center”^{Note 1} enables citizens to easily obtain and utilize disaster prevention information by aggregating and providing information available such as rainfall as well as provide a comprehensive array of information on disaster responses and disaster prevention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

(ii) Development of Hazard Maps

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

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/>



(iii) Improvement of Disaster Prevention Weather Information

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

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

Column

Transmission of Emergency Warnings via Early Warning Mail service

Early Warning Mail service is a service provided by cellular phone operators (NTT DOCOMO, KDDI and Okinawa Cellular Telephone Company (au), and SoftBank) for free to send bulk email of disaster and evacuation information issued by the government and local governments, to cellular phones in the target areas.

The Japan Meteorological Agency (JMA) started the transmission of emergency warnings on weather (heavy rain, storm, storm surge, high waves, snow-storm, and heavy snow) and volcanic eruption via Early Warning Mail service on November 19, 2015, in addition to the earthquake early warnings and tsunami warnings already in service.

As the result, all the emergency warnings issued by JMA are sent through Early Warning Mail service. Such email is directly transmitted to individual users of cellular phones, so this is an effective measure to convey emergency warnings that are extremely urgent.

Emergency warnings are issued to alert people to the significant likelihood of catastrophes caused by natural phenomena. When the warnings are issued, disasters may already have occurred, so people should pay attention to information from television, radio, local governments, etc. If it is difficult to check such information, people need to heed the surroundings and try to take all measures to protect themselves. It is also important not to wait for an emergency warning to be issued, but to take refuge proactively while paying attention to disaster prevention weather information announced by JMA by stages, such as advisories and warnings, and information from local governments, etc.

Early Warning Mail service regarding heavy rain

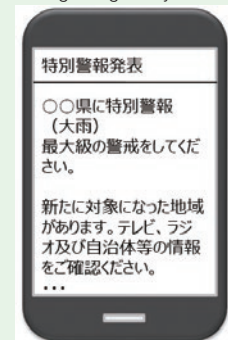


Image is for illustration purpose.
Only available in Japanese text.
Source) Japan Meteorological Agency

(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.

(i) Disaster Response by TEC-FORCE (emergency disaster countermeasures detachment)

In order to respond to the occurrence or likelihood of large-scale natural disasters, the TEC-FORCE (Technical Emergency Control Force) was established in FY 2008 and is available for deployment to smoothly and rapidly implement technical support for the local government of the affected area to carry out various emergency disaster measures such as rapidly assessing the extent of the disaster, prevent expansion of damage, and rapid recovery of affected areas. In FY 2015, TEC-FORCE dispatched approximately 1,100 members rendering approximately 3,200 man-days of service to eighty-eight municipalities in twenty-three prefectures that sustained damage as a result of a number of serious weather events, including the volcanic eruption at Kuchinoerabujima Island in May, heavy rains that began on June 24, Typhoon No. 11 that struck in July, Typhoons No. 15 and 16 that struck in August, torrential rains that fell in the Kanto and Tohoku regions in September 2015, and heavy snow that fell on January 23, 2016. From the time disaster struck, technical support was provided in each case, such as by ascertaining damage conditions and preventing damage from spreading.

(ii) 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).

(iii) Deploying Information and Telecommunication Systems and Machinery in Preparation for Disasters

To secure information communication systems in the event of a disaster, the MLIT headquarters, Regional Development Bureau, and related organizations are connected with a highly reliable information communication network consisting of microwave networks and optical fibers, in addition to satellite communication channels to strengthen the system for gathering information from the disaster site, are used to create a high mobility system. Also, 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 across the nation, so that in the event of a large-scale disaster, the framework will be able to execute rapid deployment.

(iv) 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, firefighting 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.

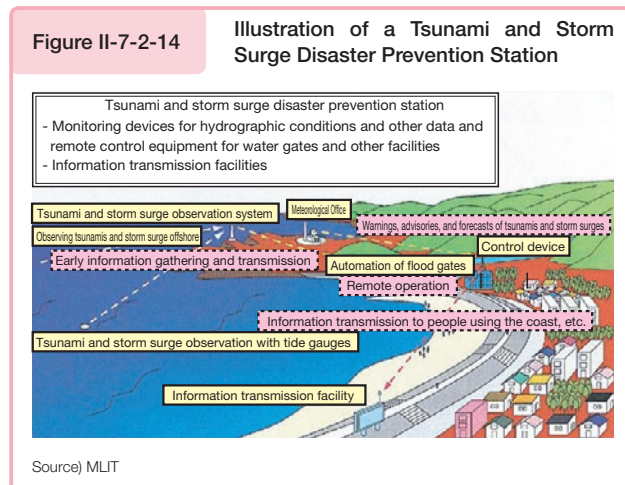
(v) Preparing for Initial Response at Sea

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

Damage caused to public civil-engineering facilities under the jurisdiction of the MLIT (including rivers, roads, coastal areas, and sewage systems) in 2015 is reported to have totaled approximately 185 billion yen (at 6,819 sites) due to the frequent occurrence of disasters nationwide, including a disaster caused by record amounts of torrential rains in the Kanto and Tohoku regions in September 2015 attributed in part to the arrival of Typhoon No. 18 and inundation damage caused to Anan-city, Tokushima, as a result of the arrival of Typhoon No. 11 in July.

In response to the damage caused by these natural disasters, technical advice to facilitate rapid restoration and reconstruction and the prevention of secondary damage as well as other forms of support for affected local governments were provided, such as by dispatching TEC-FORCE to local areas immediately after each area was visited by a disaster and by dispatching specialists registered with the Association of Nationwide Disaster Prevention to local areas as requested by local governments under a system for dispatching technical disaster recovery experts in order to support the formulation of disaster recovery and rehabilitation plans.

In order to help local governments dealing with an especially heavy concentration of damage recover quickly, administrative procedures up to the point at which a project is adopted have been significantly reduced through the simplification of the assessment process in order to accelerate disaster recovery. For example, the maximum amount of a project that can undergo a paper-based assessment rather than an on-site assessment has been increased from less than JPY three million in ordinary cases to less than JPY ten to thirty million, depending on the local government.

Costs for disaster countermeasures and the promotion of other emergency projects have been administered for (thirty-five) areas that have been damaged by natural disasters, including the torrential rains that fell in the Kanto and Tohoku regions as well as other examples of torrential rains, landslides, heavy snow, and avalanches attributable to Typhoon No. 11 and other such weather events. In order to help ensure the safety and security of residents, disaster-prevention measures have been carried out again on an emergency basis.

Column

Support being offered, such as technical advices on disaster recovery and improved recovery projects

When a serious disaster occurred, prompt and proper responses are required at the disaster site. The local government in the disaster area needs to develop a plan for recovery of facilities and improved recovery, quickly and smoothly. However, as a matter of fact, they face a shortage of engineers well experienced in disaster sites, so their responses tend to be slow. Many local governments are racking their brains over how to deal with disasters.

With this situation in mind, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) has been offering technical support for disaster recovery to local governments in disaster areas, in addition to the system of TEC-Force.

○Emergency survey of disasters

In the emergency survey of disasters, when the disaster level is extraordinary, such as a catastrophe or human damage occurring in a large area, disaster appraisers are dispatched to the sites so as to swiftly understand the disaster status and to give instructions on stopgap measures and establishment of recovery policies to the public civil engineering facilities.

○System to dispatch experts of disaster recovery engineering

In the system to dispatch experts of disaster recovery engineering, when a public civil engineering facility suffers a disaster, experts registered on the Association of Nationwide Disaster Prevention are dispatched to disaster sites in order to give support for disaster investigation and advises on recovery construction methods.

Emergency disaster survey (conducted in Kanuma-city, Tochigi)



Source) MLIT

Emergency disaster survey (report submitted to Joso-city, Ibaraki)



Dispatching of disaster recovery engineers (survey conducted in Minamiaizu-town, Fukushima)



In FY 2015, upon requests from local governments (Miyagi, Fukushima, Tochigi, and Ibaraki) in areas hit by Kanto-Tohoku Rainfall Disaster in September 2015, the emergency survey of disasters and the system to dispatch experts of disaster recovery engineering were effectively utilized, and efforts were made toward early recovery.

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

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

3 Secure Transportation Systems Resistant to Disasters

(1) Ensuring Redundancy and Substitutability

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

The road network 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. Disaster alliances with private sector businesses to implement swift road openings are concluded, and a council for road administrators to create a framework that keeps roads open was established. In addition, based on the Disaster Countermeasure Basic Act amended in November 2014, development of the system and equipment that allow road administrators to smoothly move vehicles for swift removal of road obstacles is being promoted.

Also, big data such as ETC 2.0 probe information and private probe information are used effectively to grasp early damage situations, thus enhancing initial responses.

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

(3) Accelerating removing of utility poles

We are committed to removing utility poles to prevent them from falling down and blocking the traffic of emergency vehicles in the event of earthquake. We started working on the procedures to prohibit from building new utility poles on emergency transport roads and special measures for the property tax.

(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, disaster countermeasures that take into account disaster prevention-related plans for the area in which an airport is located and links to other airports have been studied. According to the results of these studies, templates for formulating evacuation and rapid recovery plans in the event of an earthquake or tsunami striking the given airport have been drafted.

(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 (1,254 locations nationwide, as of February 29, 2016) 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 2013. Accordingly, the Act to Partially Amend the Building Standards Act came into force in June 2015.

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

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

Backed by key persons, a research committee for newly developing a housing defect warranty performance system was launched in FY 2015 as a fresh opportunity for engaging in ongoing studies for future reviews of this system. Issues to date have been subject to follow-up action and opinions have been exchanged for future reviews.

(2) Ensuring the Safety of Elevators and Play Facilities

While surveys to elucidate the causes of accidents involving elevators, escalators, and play facilities and the training of the staff members of regional development bureaus in terms of safety and accident measures continue to be carried out, initiatives for ensuring safety have been advanced by partially revising the system of periodic inspections and publicizing guidelines for the appropriate maintenance and management of elevators and escalators in the Building Standards Act and relevant ordinances.

Section 4 Strengthening Safety Measures in the Transport Sector

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

1 Building and improving the safety management system in public transportation

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

In FY 2015, 534 parties (77 railway parties, 198 automobile parties, 244 shipping parties, and 15 airline parties) were subject to a transport safety management evaluation.

In light of the fact that the mandate to carry out the same system was expanded to cover all chartered bus business operators (approximately 4,200 parties) in October 2013, efficient and effective evaluation techniques to be applied to what has been to date a large number of small chartered bus businesses were newly investigated. Upon implementing these techniques on a trial basis, small chartered bus business operators will be subject to full-fledged evaluations through the use of these efficient and effective evaluation techniques beginning in FY 2016.

In FY 2015, a transportation safety management seminar hosted for transportation operators by the national government in order to deepen understanding of this system was attended by 2,468 persons. In FY 2015, 6,874 persons attended seminars as part of an accredited seminar program established in July 2013 for the purpose of further disseminating and shedding light on this system for small to medium-sized business operators (a program through which transportation safety management seminars organized by private-sector organizations are accredited by the MLIT).

For the transportation safety management system, the MLIT will improve the effectiveness of the system and

Figure II-7-4-1 Outline of the transportation safety management system

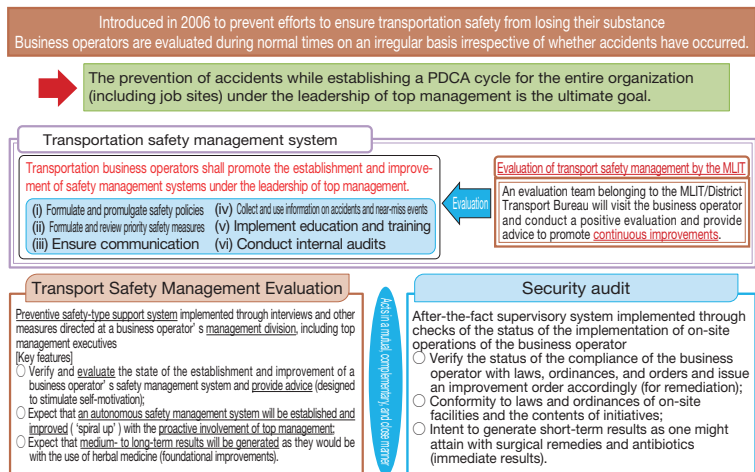
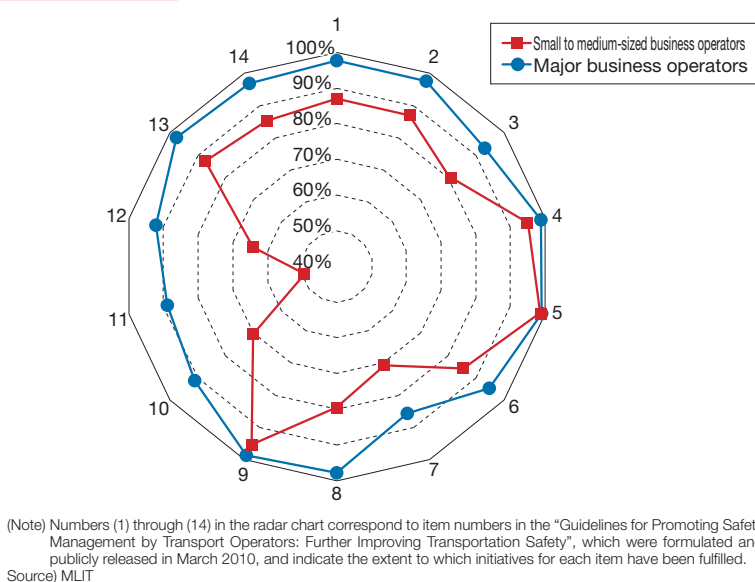


Figure II-7-4-2 Differences in terms of the status of initiatives between major business operators and other business operators (FY 2014)



disseminate it's concept to all the operators for enhancement and strengthening in the future.

2 Railway Transportation Safety Measures

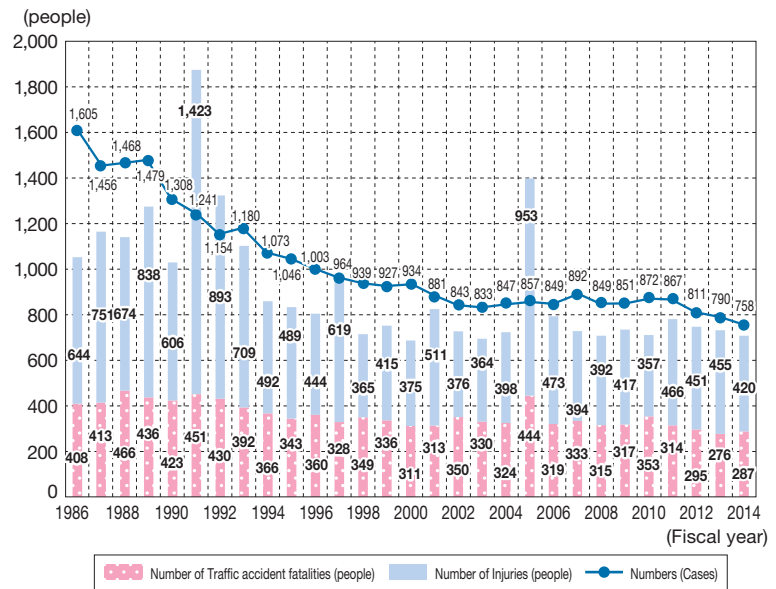
Driving accident numbers for railway traffic show a declining trend over the long term ^{Note} due to factors like the promotion of driving assistance facilities including automatic train stop systems (ATS) and rail crossing measures, but the trend is plateauing in recent years, requiring the promotion 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.

Figure II-7-4-3

Transition in number of casualties and number of driving accidents in railways



Source) MLIT

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

(ii) Measures Taken in the Wake of the Derailment of a Japan Freight Railway on the Hakodate Line

JR Hokkaido has been instructed to implement the Measures to be taken by JR Hokkaido as business improvement order and supervision order, in January 2014, and carryout supervision and guidance through periodic reports, permanent audit systems (for five years) to reliably execute the same.

In accordance with the results of an investigation pertaining to reviews of the approach taken for security audits conducted in FY 2014, railway operators are subject to modulated, more effective security audits, including planned security audits and provisional security audits conducted whenever similar types of problems occur.

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

Unopened grade crossings ^{Note} primarily in urban areas are a factor behind crossing accidents and chronic traffic congestion and measures to promptly address this problem are needed. For this reason, the road administrators and railway operators work together to prevent railroad crossing accidents, by developing crossing facilities, such as flyovers, structure improvement, and pedestrian bridges, and through the maintenance of railroad crossing safety equipment, such as railway crossing barriers, based on the Improving the Railway Crossings Act and the 9th traffic basic traffic safety plan.

In FY 2015, 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 three railroad crossings, based on the Railroad Crossing Improvement and Promotion Act.

In collaboration of road administrators and railway operators, the production of safe grade crossing passage records has commenced in accordance with crossing elements, the state of countermeasures, the conditions behind the occurrence of accidents, and other examples of objective data. It was determined that crossing measures shall be promoted on a priority basis by summarizing future measures and policies while visualizing the current state of crossings and roads.

In FY 2016, crossing measures will be further promoted based on the Act on Promotion of Railway Crossings by utilizing a system operated by the Minister of Land, Infrastructure, Transport and Tourism for designating crossings and roads that should be improved in order to designate problematic crossings even in the absence of an agreement by railway operators and road administrators as to the methods by which improvements will be carried out and by undertaking a general mobilization of measures in both structural and non-structural terms, including immediate measures involving the use of colored pavement and measures affecting areas surrounding crossings, such as by way of the development of parking spaces.

(3) Promoting the Development of Platform Doors

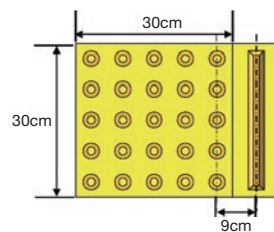
To improve the safety of the visually impaired and other rail station users, the installation of platform doors to prevent falling from the platform is being promoted (installed at 621 stations as of the end of September 2014). In accordance with the Basic Policy on Promoting the Facilitation of Mobility (March 2011), Basic Plan on Transport Policy (February 2015), and Priority Plan for Social Infrastructure Development (September 2015), we are implementing structural measures, such as by promoting the development of platform doors and tactile paving with boundary lines and the development of technologies for new types of platform doors to address the problem that arises when train doors do not line up properly with the platform, as well as non-structural measures, such as by deploying a campaign for improving the behavior of train users through a catch phrase that encourages users to reach out to and help guide visually-impaired riders to where they are supposed to go.

Figure II-7-4-4 Platform door



Source) MLIT

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



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

Source) MLIT

Figure II-7-4-6 Friendly Manners Campaign



Source) MLIT

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

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.

(1) Improving ship safety and ensuring ship navigation safety

(i) Improving Ship Safety

In order to ensure ship safety globally, the international regulations and standards have been developed at the International Maritime Organization (IMO), and MLIT has been participating actively in discussions at IMO. In particular, MLIT proposed IMO in 2015 to improve the large containerships' structural safety measures, which were developed by MLIT based on the investigation and analysis of the large containership breakage accident happened in 2013, and that proposal was decided to be reflected to the international unified regulation of classification societies.

Regarding newly established or amended regulations or standards at IMO, in December 2015, MLIT revised relevant domestic regulations, in accordance with the amendments to the Annex of the International Convention for the Safe of Life at Sea (SOLAS): reviewed requirements on the means of escape in machinery spaces, such as door and ladder, and new requirements on fire-extinguishing appliances for ships designed to carry containers on or above weather deck.

In terms of securing compliance with the international regulations and standards of foreign ships which entering into ports in Japan, and eliminating substandard ships globally, Port State Control (PSC) has been conducted by MLIT.

As specifically focused on domestic approach to ensure ship safety, in response to a fire accident on board a ferry off the coast of Tomakomai, Hokkaido, in July 2015, the investigation under the Marine Transportation Act was conducted by MLIT in parallel with the investigations conducted by the Japan Coast Guard and the Japan Transport Safety Board. As the MLIT's investigation revealed problems in terms of firefighting, the committee to discuss firefighting on board ferry, which consists of experts on fire and firefighting, was established in September 2015. In March 2016, a manual summarizing effective firefighting procedures to reinforce preparations for engaging in firefighting to be undertaken by ferry operators, the features of firefighting equipment, training methods, and other pertinent matters was compiled and publicly released. This manual is currently being used to provide guidance to ferry operators nationwide.

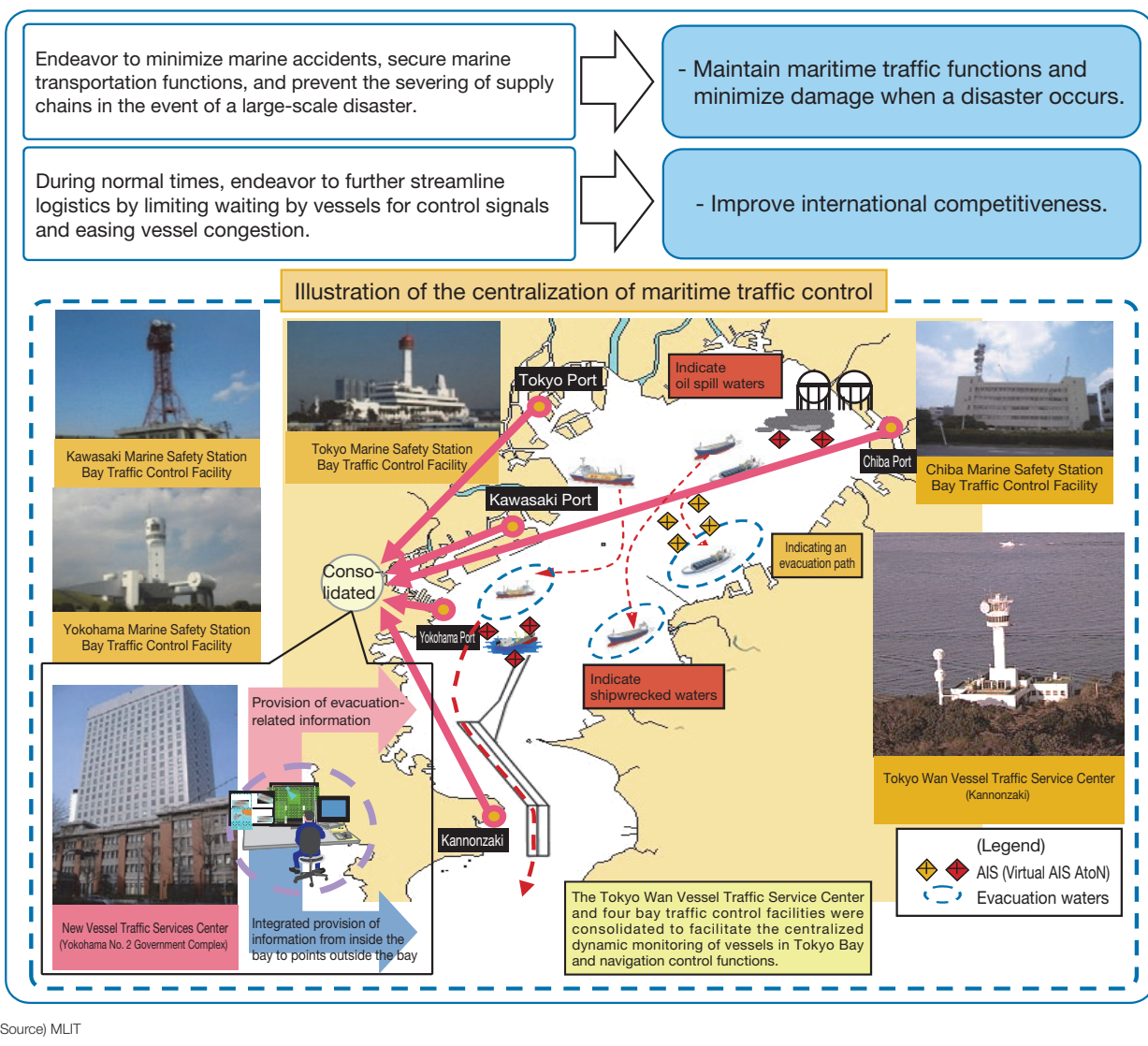
(ii) Ensuring Ship Navigation Safety

In accordance with the "Law for Ships' Officers and Boats' Operators" which complies with the STCW Convention ^{Note}, 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 publicizing the partial amendments to domestic Ministerial Ordinances came into force in April 2014 is being carried out. In accordance with the Pilotage Act, qualifications for people who can perform pilotage are defined for the safety of vessel traffic. Based on the report of the Basic Policy commission established at the Council of Traffic Policy Maritime Subcommittee, to secure a stable supply of pilots who will be needed in the future, initiatives to facilitate the acquisition of licenses required for the provision of mutual assistance among neighboring small to medium-sized pilotage districts are being carried out.

Investigation and inquiry, in accordance with the Act on Marine Accident Inquiry, are conducted for a marine technician, a small craft operator, or a pilot who causes a marine accident intentionally or negligently in the course of duties and in 2015 there were 347 cases of determinations and a total of 483 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.

Note 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.

Figure II-7-4-7 Establishing a centralized maritime traffic control system in bays



Various measures to prevent marine accidents have been developed and deployed, such as by holding liaison conferences attended by relevant ministries and agencies for the prevention of marine accidents for the purpose of providing information through the Maritime Information and Communication System (MICS), for which a new smartphone app was developed, and by organizing a national campaign to underscore the need to prevent marine accidents in collaboration with relevant organizations. In addition, a marine accident prevention workshop, in cooperation with relevant ministries and organization was held, and has implemented a variety of marine accident prevention campaign in the region, for marine accident prevention for small boats.

The Japan Coast Guard works to quickly and smoothly escort vessels to safe sea areas when a tsunami or other emergency disaster occurs. During non-emergency periods, it coordinates the Vessel Traffic Service Center in Tokyo Bay with port traffic controls offices and is building a system to carry out these operations in an integrated fashion in order to ease congestion and ensure the safe and efficient operations of vessels. It is also engaged in efforts to update systems required to maintain maritime traffic functions when an emergency disaster strikes.

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

With respect to nautical charts, we are endeavoring to upgrade electronic navigational charts, which have gained in importance thanks to the dissemination of the Electronic Chart Display and Information System (ECDIS). Moreover, for the area where complex navigational rules apply the English version of the routing guide was published to promote the understanding of the navigational rules, along with, publishing the nautical charts in just English for the foreign seafarers

as part of provision for prevention of the marine accident. Nautical charts corresponding to fifteen major ports affected by the Great East Japan Earthquake underwent complete revisions based on the results of surveys conducted after the earthquake. These revisions were completed by October 2015.

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

For Aids to Navigation, development is performed effectively and efficiently in accordance with the vessel traffic environment as well as needs and in FY 2015, improvements and renovation was carried out in 388 locations. The operations of virtual aids to navigation as provided through Automatic Identification System (AIS), which displays icons on radar screens for vessels with the use of AIS, began in November 2015 in the Akashi Strait and Tomogashima Channel.

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

Ensuring the safety of ship navigation in the Straits of Malacca and Singapore, highly important maritime transportation routes through which eighty percent of crude oil imported to Japan passes, is important. Cooperation for the financing of the Aids to Navigation Fund ^{Note 1} is being provided under the cooperative mechanism ^{Note 2} with the involvement of littoral states and users. In addition, new hydrographic surveys on the straits have been conducted since October 2015 jointly by Japan and three littoral states (Indonesia, Malaysia, and Singapore). Japan has provided technical cooperation through the provision of financing and the dispatching of experts, by maritime stakeholders. Japan will continue the cooperation for safety of navigation and protection of environment in the straits through public-private partnership, along with the good relationship with the littoral states.

(2) Promotion of safety measures for the passengers

About 44% of cases reported about the dead or missing passengers are due to fall accidents into sea. In order to survive after the fall, first thing to do is to float, and then promptly request a rescue. For this, the Japanese Coast Guard is working to disseminate and enlighten self-rescue measures based on the three principles: wear a life jacket at all times, ensure appropriate contact means such as a portable telephone packed in a waterproof package, and effectively use the emergency call number “Dial 118”. In addition, the passenger mortality due to fall in the sea from small boats (fishing boats or pleasure boats), is five times higher in the passengers who do not wear a life jacket, than those who do, therefore, life jackets contributes greatly in saving the passengers from the fall. Thus, the Japan Coast Guard is endeavoring to raise awareness of the need to wear a life jacket through the provision of support for LGL ^{Note 3} activities, workshops on the prevention of marine casualties, and other initiatives.

(3) Strengthening the Rescue System

In order to engage in prompt and precise rescue activities, the Japan Coast Guard operates the 1-1-8 emergency telephone hotline and endeavors to rapidly ascertain information on the occurrence of accidents, such as by receiving information on marine accidents at any time, day or night, through the Global Maritime Distress and Safety System (GMDSS). Also, along with improving the rescue technology and capabilities of those such as special 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 costs incurred to replace or repair lighthouses and other facilities used for aiding navigation installed in the Straits of Malacca and Singapore.

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

Note 3 Refers to the family members of fishermen who are calling for life jackets to be worn. Stands for ‘Life Guard Ladies’.

4 Air Traffic Safety Measures

(1) Strengthening Aviation Safety Measures

(i) State Safety Program (SSP)

Since April 2014, the Civil Aviation Bureau, as the authorities in charge of the safety of civil aviation, has been implementing the State Safety Program (SSP), which sets forth targets for civil aviation safety and measures to be taken for their attainment, in accordance with Annex 19 of the Convention on International Civil Aviation. In FY 2015, the Civil Aviation Bureau, formulated a “Medium-term orientation for the administration of aviation safety” for which the orientation of safety targets for the next five years and of safety measures that should be implemented for their attainment has been outlined. [In going forward, a plan for the implementation of the SSP will be formulated each fiscal year based on the midterm orientation and that efforts will be made to attain the given safety targets.]

The Voluntary Information Contributory to Enhancement of the Safety (VOICES) program has been operated since July 2014 in order to collect more information relating to aviation safety that is not subject to mandatory reporting and harness such information for the improvement of safety. Recommendations such as improving airport operations have been obtained through this program. While dissemination activities have been yielding results and more reports were issued in FY 2015 than in the preceding year, attempts will be made to further increase the number of issued reports through continued work to highlight the importance of safety information. Efforts will also be made to improve safety by making use of obtained recommendations.

(ii) Air Transport Safety Measures

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

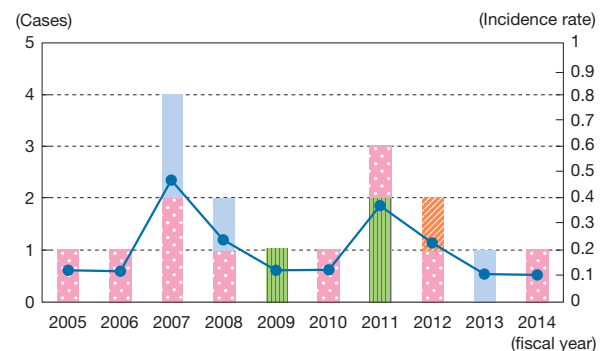
(iii) Certification of Domestic Jetliners

With the development of Japan’s first domestic jetliner, 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. The MLIT carried out safety evaluation to determine whether to allow test aircraft to undergo test flights based on the results of strength tests, function tests, and analyses conducted for the first flight by designers, which included taxing tests began in June 2015. Special flight permit was issued at the end of October 2015. Subsequently, the first flight was successfully completed in November of the same year. Test flights are slated to be carried out using five different test aircraft to certify compliance with standards and performance and the MLIT will proceed the safety assessment.

(iv) Safety Measures Applicable to Unmanned Aircraft

Nowadays, we are seeing unmanned aircraft such as drones, which are rapidly gaining in popularity, used in more and

Figure II-7-4-8 Number 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.

more different areas of application, such as aerial photography, the spraying of agricultural chemicals, and infrastructure inspections. While it is expected that they will be used to a greater extent in the future, crash landings have occurred, and other examples of safety-related issues have emerged. For this reason, the Aeronautical Act as amended in September 2015 was enacted and came into force in December of the same year. Minimal operating rules for unmanned aircraft, such as in terms of the airspace in which they are allowed to fly and the methods by which they can be operated, were introduced with great urgency.

Beginning in December of the same year, meetings of the Public Private Round table for the Dissemination of UA have been held to sufficiently obtain the opinions of concerned parties while taking into consideration technological progress and the state of the diversification of applications. Discussions on properly designing a system to ensure greater safety for unmanned aircraft while considering the promotion of the utilization of unmanned aircraft are proceeding.

(2) Developing Air Traffic Systems for Aviation Safety

Since the majority of serious incidents concerning air traffic services originate from human error, measures to prevent

Column

For a safe flight of unmanned aircrafts (drones, radio-controlled planes, etc.)

In December, 2015, an amendment to the Aeronautical Act was issued to enforce flying rules on unmanned aircrafts. The outline of rules is as follows. You can see the details on the website of the Ministry of Land Infrastructure, Transport and Tourism (MLIT) (http://www.mlit.go.jp/koku/koku_tk10_000003.html).

[Outline]

(i) Target aircrafts

Any airplane, rotorcraft, glider or airship which cannot accommodate any person on board and can be remotely or automatically piloted (excluding those lighter than 200 g. The weight includes that of battery).

(Examples of unmanned aircraft)



(Drone (multi-copter))



(Radio-controlled airplane)



(Crop-dusting helicopter)

(ii) Prohibited airspace for flight

Any person who intends to operate an unmanned aircraft (UA) in the following airspaces is required to obtain permission from the Minister of Land, Infrastructure, Transport and Tourism because of the high likelihood of collisions with a manned aircraft, and harm to people or others on the ground.

- Airspace around airports (airspaces above approach surface, etc.)
- Airspace above 150 m above ground level or water surface
- Above Densely Inhabited Districts, which are defined based on the results of national censuses.

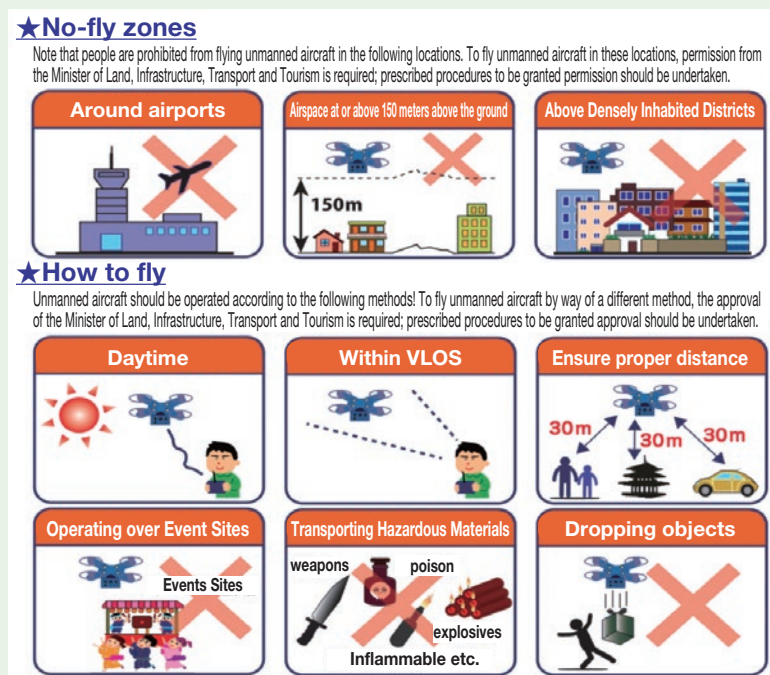
(iii) Operational limitations

Any person who intends to operate an UA is required to follow the operational conditions listed below, unless approved by the Minister of Land, Infrastructure, Transport and Tourism.

- Operation of UAs in the daytime (from sunrise to sunset)
- Operation of UAs within Visual Line of Sight (VLOS) while constantly watching the UAs and the surroundings
- Maintenance of 30 m operating distance between UAs and persons (the third persons) or properties (buildings, automobiles, etc., belonging to third party)
- Do not operate UAs over event sites such as festivals and fairs, where many people gather.
- Do not transport hazardous materials such as explosives by UAs
- Do not drop any objects from UAs.

(iv) Permission & Approval

If you intend to fly an UA in the prohibited airspace for flight or in the way not depending on the operational limitations, you are required to submit an application for the permission or approval to MLIT at least 10 days (excluding Saturdays, Sundays, and holidays) before you fly an UA. As for the application form, procedure, and prior consultation, please visit the website shown above.



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

During FY 2015, accidents subject to investigations by the Transport Safety Board consisted of thirty-nine aviation incidents, fourteen rail incidents, and 893 incidents involving ships and vessels that occurred and were investigated.

Investigation reports for thirty aviation accidents whose investigations were finished in FY 2015 were publicly released. Released in May 2015, a key report consisted of an investigation report on a serious incident in which a plane that was taking off mistakenly entered a runway that was at the time being used by a plane that was approaching for a landing at Naha Airport in July 2012.

Likewise, investigation reports for twenty-one rail accidents were released. Released in December 2015, key reports consisted of investigation reports on freight car derailments that occurred on JR Hokkaido's Esashi Line in September 2012 and June 2014. In conjunction with the release of these reports, opinions were presented to the Minister of Land, Infrastructure, Transport and Tourism to have concerned parties come together and carry out a review with a view to improving the safety of freight train operations.

Likewise, investigation reports for 974 accidents involving ships and boats were released. Released in December 2015, a key report consisted of an investigation report on a major accident in which an oil tanker called Shokomaru exploded in flames offshore just south of Himeji Port in May 2014, resulting in deaths and injuries caused to five crewmembers.

The Transport Safety Board upgraded the functions of hazard maps for ship accidents that were designed to allow anyone to search locations where multiple ship accidents have occurred and the results of accident investigations by superimposing them on online electronic maps and commenced the operations of a mobile version of hazard maps for ship accidents that were designed to allow information on the vicinity of a user's current location to be quickly searched with a smartphone or tablet in June 2015.

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 FY 2015, 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. When no public transport accidents needed to be dealt with, the Support Office was involved in numerous other activities, such as by providing education and training to staff members who provide support, building networks with relevant outside organizations, holding support forums for the victims of public transport accidents, and urging public transport operators to formulate plans for the provision of support to victims.

In 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.

Figure II-7-4-9

Ship Accidents Hazard Map (mobile version)

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



Example of accident information displayed

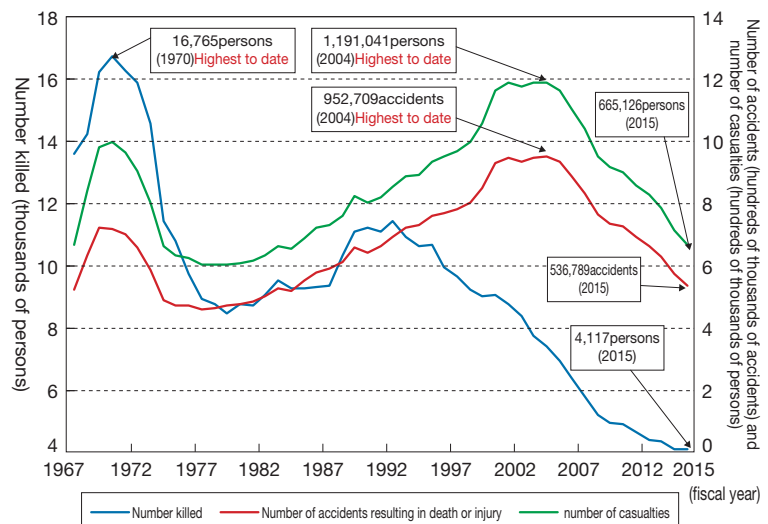
Source) MLIT

7 Safety measures for road traffic

In 1970, the number of traffic accident fatalities peaked at 16,000. This figure declined to a quarter of this level, or 4,117 fatalities, (an increase of 4 over the preceding year) in 2015 but then rose for the first time in fifteen years. Elderly persons account for a majority of traffic accident fatalities. Approximately half, or 2,160 fatalities, were killed while walking or riding a bicycle. With half of these incidents taking place within 500 meters of each victim's home, the situation remains grim. For this reason, efforts will be made to further reduce traffic accidents and various measures will be implemented in coordination with the National Police Agency and others.

Figure II-7-4-10

Changes in the number of traffic accidents and number of casualties



(Notes) 1 Until 1959, accidents resulting in minor damage (injury suffered for less than eight days, property damage of up to 20,000 yen) were not included.
2 Accident numbers for 1966 and thereafter do not include accidents resulting in only property damage.
3 Figures for 1971 and earlier do not include Okinawa.
(Source) Produced by the MLIT using materials provided by the National Police Agency.

(1) Promoting Efficient and Effective Traffic Accident Measures

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

With respect to residential streets, which account for a significant percentage of fatal and injury accidents involving pedestrians and cyclists, standard specifications for speed bumps, curb extensions, and other measures shall be formulated to secure safe walking spaces by restricting the flow of vehicular traffic and forcing a reduction in vehicular speeds. Comprehensive measures to inhibit traffic accidents are being advanced in collaboration with prefectural public safety commissions, such as by decreasing the width of vehicular roads and widening roadside strips in combination with zonal speed limits, engaging in sidewalk development projects, and carrying out measures to install speed bumps.

(2) Promoting Safety Measures for School Commute Routes

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

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

(3) Safety Driving Support on Expressways Using IT

Japan is the first country in the world that commenced the ETC2.0 service, which utilizes communication spots on expressways installed across the country and onboard units. Safe driving support is promoted by providing alerts on locations where accidents occur frequently and on objects that have fallen onto the road as well as information on snow accumulations, overtopping waves, and other such circumstances to the vehicle's car-navigation system. The use of information technology and effective measures based on partnerships with automobile manufacturers and other private-

sector entities to solve the problem of cars driving in the wrong-way driving on expressways, a situation that at any given time is highly likely to cause a major accident, are being studied.

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

Bridges under municipal management account for approximately seventy percent (480,000 bridges) of the approximately 720,000 bridges nationwide. In the United States, bridges managed at the municipal level account for no more than ten percent of the total number in existence in the country. In managing the vast majority of bridges to be found in this country, Japanese municipalities need to properly maintain, repair, and upgrade bridges under their care.

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.

Having received recommendations on the full-scale implementation of measures to deal with the obsolescence of roads, as summarized by the Infrastructure Development Council's Road Subcommittee on April 14 of the same year, we will henceforth endeavor to define maintenance cycles (clarify the obligations of road administrators) and build a framework for carrying out required actions as part of these maintenance cycles.

We have been more proactively engaged in the provision of support for measures undertaken by local governments to deal with aging road structures. This include the steady promotion of regular inspections through the use of road maintenance councils that had been set up in all prefectures by July of the same year, the placement of batch orders of inspection operations at a local level, the provision of training for the staff members of local governments, the provision of technical support by the national government where the national government repairs on behalf of the local government based on the evaluation results by the national government officials, and the establishment of subsidy systems for large-scale repair and upgrading jobs.

In order to deal with the obsolescence of expressways, large-scale upgrading and repair projects newly outlined in operational implementation plans according to amendments to the Road Act enacted in June of the same year are systematically being advanced.

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

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

(i) Establishing a Framework for Safety through the Management of Transportation Safety

In accordance with a transportation safety management program introduced in October 2006, business operators have

been establishing and improving safety management systems internally on a company-wide basis. In 2015, 146 operators were subject to evaluations of transportation safety management whereby the state verifies the status of the implementation of these systems.

(ii) Ensuring Compliance on the Part of Motor Carrier Businesses

In order to enforce the Labor Standards Act and other relevant laws and ordinances and thoroughly manage operations, business operators who have willfully driven while under the influence of alcohol, business operators who have caused a major accident, and business operators who have recently entered into a new market shall be subject to thorough audits as well as to audits and oversight carried out jointly by relevant organizations. Unsuitable business operators will be strictly punished according to tightened standards.

Willful business operators who contravene laws and ordinances shall be subject to efficient and effective audits, including audits on a selective, priority basis. In response to a ski bus accident that occurred in Karuizawa in January 2016, chartered bus business operators nationwide were subject to curbside audits and focused audits on an emergency basis.

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

(iii) Eliminating Drunk Driving

With respect to the thorough use of breathalyzer tests with alcohol detection devices during roll calls and to proper knowledge of and usage bans on dangerous drugs in the context of efforts to eliminate driving while under the influence of dangerous drugs, guidance is being provided to business operators and operating managers whenever the opportunity arises through the use of workshops, nationwide transportation safety campaigns, general transportation safety checks conducted during the year-end, New Year's period, and other such initiatives in order to thoroughly ensure that drivers are guided and supervised on a daily basis.

(iv) Promoting Safety Measures Based on the Use of IT and New Technologies

We are providing support for the deployment of equipment that will contribute to the advancement of operation management such as digital operation recorder and for advanced initiatives such as preventing overwork driving, from the point of view to support the efforts made to prevent the traffic accidents caused by the automotive transportation operators. Next-generation operating management and support systems linking vehicles with onboard devices and health-care instruments are being studied.

(v) Accident-Prevention Measures Based on Accident Patterns by Industrial Sector and Key Factors

In order to promote transportation safety, we are implementing accident-prevention initiatives based on characteristic accident patterns for each industrial sector—trucks, buses, and taxis—in concert with on-site concerned persons and are endeavoring to improve the provision of guidance to and the supervision of entry-level drivers through the establishment of a quasi-medium-size license as a new licensing category for the drivers of trucks.

(vi) Measures Based on the Recommendations of the Committee Investigating Accidents Involving Commercial Vehicles

Established in collaboration with the National Police Agency in 2014, the Committee Investigating Accidents Involving Commercial Vehicles has conducted more advanced, complex investigative analyses of accident factors, such as by endeavoring to further clarify the organizational and systemic issues behind major accidents involving commercial vehicles that have a large impact on society, in order to receive objective, higher-quality recommendations on recurrence-prevention measures. Reports for eight cases concerning incidents subject to special important investigations were then publicly issued.

(vii) Promoting Measures to Prevent Accidents Caused by Rapid Physical Changes Affecting Drivers

In addition to endeavoring to thoroughly disseminate the Manual on Health Management for Drivers of Commercial

Vehicles, which was revised in April 2014, a Council for Discussing Measures to Deal with Health-Attributable Accidents Involving Commercial Vehicles was established in September 2015 to promote screenings as a more effective tool for enabling the early detection of sleep-disordered breathing, brain diseases, heart disease, and other key diseases as recommended in the aforementioned manual. Measures to promote the dissemination of such screenings and other matters are being studied by this council.

(viii) Safety Measures for the Land Transportation of International Maritime Containers

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

(7) Measures in Response to a Ski Bus Accident in Karuizawa

On January 15, 2016, a chartered bus (carrying forty-one passengers) swerved into the oncoming lane and rolled down the right side of the road on the Usui Bypass on National Route 18 in Karuizawa, Nagano near the Iriyama mountain pass. Fifteen individuals (thirteen passengers and two crewmembers) were killed and twenty-six passengers sustained light to heavy injuries in this serious accident. In order to study thorough recurrence-prevention measures designed to prevent such a tragic accident from ever occurring again, meetings of a Committee of Experts to Investigate Measures in Response to the Ski Bus Accident in Karuizawa have been held to discuss, from various perspectives—such as in terms of reinforcing before-and-after safety checks imposed on chartered bus business operators, optimizing the business environment vis-à-vis travel agents, and visualizing elements of safety for users—fundamental safety measures corresponding to structural issues, such as those relating to the significant increase in the number of chartered bus business operators and the audit personnel system that emerged after regulations were eased, a shortage of drivers tied to a shrinking and aging population, and business relations between travel agents and chartered bus business operators.

In accordance with the extent to which a study of an interim summary of recurrence-prevention measures had been conducted, three matters came into focus on March 29, 2016: matters that should be implemented promptly in terms of the imposition of strict punishment, such as in terms of the revocation of business licenses granted to business operators who fail multiple times to correct and ameliorate violations of laws and ordinances; matters for which realization should be pursued in terms of the establishment of a framework for the provision of safety information on chartered bus business operators and the promotion of the dissemination of systems for handling driver abnormalities; and matters that should continue to be studied in terms of conducting reviews of the ways in which operating managers should perform their duties.

For matters that should be implemented promptly, matters that can be implemented shall be promptly implemented. Committee members will continue to discuss matters for which realization should be pursued and matters that should continue to be studied, summarize comprehensive measures for the prevention of recurrence by this summer with respect to these matters, and move to reliably implement these measures going forward.

(8) Comprehensive Safety Measures for Automobiles

(i) Considering Vehicle Safety Measures for the Future

The Technical Safety Working Group under the Automobile Subcommittee of Road Transport Session, beneath the Transport Policy Council was held, in response to the formulation of the tenth Fundamental Traffic Safety Program (for FYs 2016 to 2020). The working group discussed about future safety measures, such as the advanced emergency braking system, while considering the current status of traffic accidents and development of automotive technologies.

(ii) Expanding, enhancing, and strengthening safety standards

In order to improve the safety of automobiles, ten international regulations were adopted in Japan. Due to this adoption, testing conditions based on simulations of lateral collisions with electric utility poles and safety standards for battery-type electric motorcycles were newly developed. Japan is the first country in the world to formulate safety standards applicable to fuel-cell-based motorcycles.

(iii) Promoting the Development, Commercialization, and Popularization of Advanced Safety Vehicles (ASV)

With the cooperation of manufactures and academics, the popularization of ASV technology, such as advanced emergency braking systems were promoted. Also, as the output of the fifth-term ASV promotion plan, guidelines on systems for handling driver abnormalities and communications-based driving support systems were formulated.

Figure II-7-4-11

Braking to mitigate collision damage



Source) MLIT

(iv) Providing Safety Information Through Automobile Assessment

In order to promote the development of safer automobiles, and enable consumers to choose the safe automobiles and child restraint system, the results of the assessment of automobile safety were published. Assessment of rear-view monitor commenced in FY 2015.

(v) Efforts Towards Realization of Automatic Driving

Established under the purview of the UNECE World Forum for Harmonization of Vehicle Regulations (WP.29), the Automatically Commanded Steering Function Informal Working Group, co-chaired by Japan, has spearheaded the formulation of international standards on automatic driving, such as by proposing standards for automatic steering that could allow for automatic driving on expressways.

(vi) Swift and Steady Implementation of Automobile Recalls and Informing Users and Others

In order to carry out vehicle recalls promptly and reliably, information is collected from vehicle manufacturers and users and efforts are made to reinforce systems for the collection of information from parts suppliers. In addition, checks are conducted and guidance is provided when audits are performed with respect to recall operations carried out by vehicle manufacturers. Technical verifications are conducted by the National Agency for Automobile and Land Transport Technology (known as the National Traffic Safety and Environment Laboratory until March 31, 2016) on vehicles that are questionable in terms of conformity of the safety or environmental regulations. In order to reinforce the collection of information on defects, dissemination activities in connection with the hotline concerning information on automobile defects (www.mlit.go.jp/RJ/) are being proactively undertaken.

In addition, the information collected by the MLIT including malfunctions, accidents, and fires are made public and information is provided to users regarding matters that require the attention of users or details necessary for the appropriate usage or maintenance and management or to take appropriate measures when malfunctions occur.

Also, in FY 2015 the number of recall notifications was 368 and the number of recalled vehicles was 18,990,000.

(vii) Sophistication of Vehicle Inspections

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

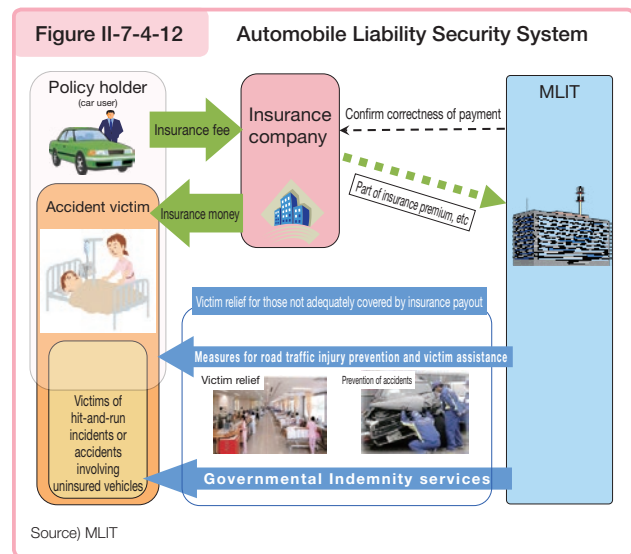
Note Conduct whereby, after a vehicle undergoes a new inspection with components removed, the given components are re-attached to the vehicle and used accordingly.

(9) 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.

(10) Safety Measures for Mechanized car parking

In light of the occurrence of accidents involving deaths in mechanized car parking, we are proceeding with studies of JIS standardization of safety standards applicable to mechanical parking equipment together with industry groups in order to endeavor to further improve the safety of mechanical parking equipment.



Section 5 Crisis Management and Security Measures

1 Promoting Crime and Terrorism Counter-measures

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

(i) International Initiatives for Security

In addition to participating in meetings and projects in the field of transport security at international 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.

(ii) Anti-Piracy Measures

According to the International Maritime Bureau (IMB), there were 246 instances of piracy and armed robbery in 2015. Broken down by region, the sea area around Southeast Asia accounted for 147 instances, Africa (Gulf of Guinea) accounted for thirty-one instances, and the sea area around Somalia and the Gulf of Aden accounted for zero instances.

While the number of heinous cases of piracy increased rapidly in the sea area around Somalia and the Gulf of Aden beginning in 2008, such cases have declined to low levels in recent years thanks to anti-piracy efforts by the navies of different countries, the implementation of self-defense measures based on best-management practices (BMP) ^{Note} on the part of merchant ships, and the initiatives of the international community, such as in terms of the presence of armed security on board merchant ships. Nevertheless, cases in which vessels are pursued by suspicious boats continue to emerge and circumstances in terms of the navigation of merchant ships remain unpredictable.

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. The MLIT provides a contact point for escort requests from shipping companies and others and

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

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.

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, airplanes have been dispatched to and piracy-related safe-passage drills have been performed in collaboration with coast guard agencies belonging to the relevant countries for coastal states in the sea area around Somalia and the Gulf of Aden while patrol vessels and airplanes have been dispatched to and anti-piracy drills, training, and lectures have been held in collaboration with coast guard agencies belonging to the relevant countries for coastal states in the sea area around Southeast Asia. Members of coast guard agencies belonging to various countries have been invited to Japan and experts have been dispatched on a short-term basis to other countries to carry out training programs. Contributions are being proactively made to international partnerships, such as by dispatching personnel to the Information Sharing Center (ISC), which was established according to the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP).

Figure II-7-5-1

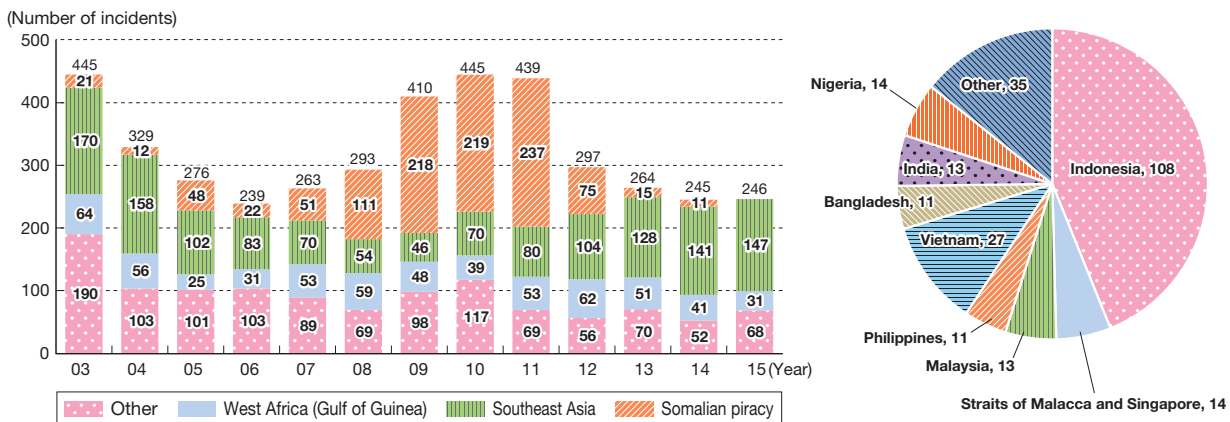
State of the occurrence of piracy and armed robbery against Japanese-related ships as reported to the MLIT (2015)



Source) MLIT

Figure II-7-5-2

“Changes in the number of incidents involving piracy and armed robbery worldwide (according to the IMB Report)” and “Number of incidents involving piracy and armed robbery by sea area in 2014 (according to the IMB Report)”



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

(iii) Security Measures for Ports

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

As ISIL was gaining ground in the Middle East, Japanese nationals were being killed in Syria and Tunisia (January, February, and March 2015), a Russian plan was downed in Egypt (October 2015), and a series of terrorist attacks targeting Paris and Brussels occurred (November 2015 and March 2016). These incidents illustrate the ongoing seriousness of the global threat of terrorism. In light of these circumstances, counter-terrorism measures are being developed in each respective field and thorough supervision and inspections of counter-terrorism measures are implemented during busy seasons.

Figure II-7-5-3

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



(Source) MLIT

(i) Promoting Counter-Terrorism Measures for Railways

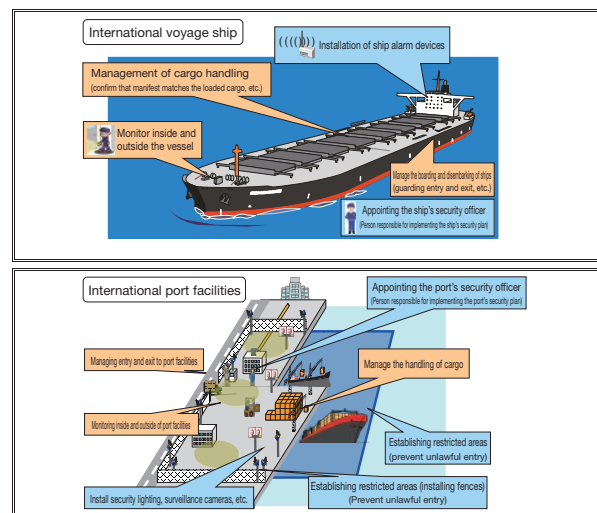
In addition to increasing security cameras within stations and strengthening patrols, “crisis management levels” are set and operated as well as “displaying security and user participation” ^{Note} as the axis of promoting counter-terrorism measures. Also, the sharing of information regarding railway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

(ii) Promoting Counter-terrorism Measures for Ships and Ports

MLIT has been engaged on ensuring security, through approval of the Ship Security Plan of the Japanese ships engaged on international voyage and ship inspection to them, and also approval of the Port Security Plan of the international port facilities in Japan and inspection to them, furthermore control of all the ships entering into the ports, such control includes inspection to them and Port State Control (PSC), in accordance with “Act on Assurance of Security of International Ships and Port Facilities.” In addition, in the light of the results of inspections for the Japanese international port facilities and the security levels of foreign countries, MLIT has increasingly enhanced its port security measures, for example, the three-item check (checks on the ID, organization and purpose of entrance) at all the Japanese international port facilities after July 2014.

Figure II-7-5-4

Security Measures for International Voyage Ships and International Port Facilities



(Source) MLIT

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

(iii) Promoting Counter-Terrorism Measures for Aviation

In order to do every possible thing to prevent 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. As part of efforts to enhance security checks at airports, advanced body scanners will be installed at major airports in our country by the 2020 Tokyo Olympic and Paralympic Games. Operational trial was conducted and efforts will be undertaken to otherwise reinforce aviation security measures. Also, information exchanges with major countries are carried out through active participation in international conferences and other opportunities to share Japan's experience with the latest security measures.

(iv) Promoting Counter-Terrorism Measures for Automobiles

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

(v) Promoting Counter-Terrorism Measures for Major Facilities

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

(3) Balancing Security and Efficiency of Logistics

For international logistics, initiatives to balance security and efficiency are spreading to each country, even in our country, the dissemination of AEO system ^{Note 1} for logistics companies is being promoted. At present, the cargo for which the export declaration is done by AEO exporter, and AEO bonded transporter transports the cargo up to the bonded area, export declaration for the cargo is entrusted to AEO customs broker, also receiving the export 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 ^{Note 2} based on international standards established by the ICAO is adopted. Then, based on the request of the United States for further security strengthening, the system was revised while maintaining the smooth performance of the logistics, applied from October 2012 for the United States for international passenger flights equipped with cargo, the same system was also expanded for application of all international passenger flights equipped with cargo from April 2014.

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

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.

(4) Information Security Measures

As the dependence on IT for socioeconomic 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. As we prepare to host the Tokyo Olympic and Paralympic Games in 2020, information security measures will need to be further fortified.

For this reason, the MLIT is engaged in information security measures, such as by reinforcing information system functions and enhancing and fortifying arrangements for coping with cyber-attacks, in accordance with the policy formulated by the government's Cybersecurity Strategy Headquarters. In implementing information security measures for areas of critical infrastructure (aviation, railway, and logistics), efforts are being made in collaboration with the National center of Incident readiness and Strategy for Cybersecurity (NISC) to improve the ability of critical infrastructure in each area to deal with cyber-attacks through drills involving hypothetical cyber-attacks.

2 Establishing a Response System for Accident Disasters

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

For accident disasters at sea, coordination with relevant organizations is being furthered such as ensuring a dispatch system for patrol vessels and aircraft and readying disaster mitigation equipment in addition to implementing joint training. Also, 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 addition to making sure to police territorial waters and control foreign fishing vessels in the sea area around the Senkaku Islands, the Coast Guard is steadily developing new jet airplanes and regulatory capacity advanced patrol vessels in order to adequately respond without security holes to suspicious incidents and unlawful conduct in sea areas around Japan, including remote islands. We will also systematically proceed with the replacement of superannuated patrol vessels with helicopters, other patrol vessels and aircraft with alternative high-performance patrol vessels and aircraft and the development of relevant facilities.

(2) Promoting Counter-Terrorism Measures

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

Counter-terrorism measures are also being carried out by public-private partnerships formed through close ties with relevant organizations and local governments. Such measures include the provision of thorough guidance to business operators on the matter of self-security, increased awareness of the risks of terrorism committed against passengers, calls for the early detection of suspicious incidents, and the implementation of joint drills on counter-terrorism measures.

In addition, we are striving to reinforce counter-terrorism measures in anticipation of the hosting of the Ise-Shima Summit in 2016 and the Tokyo Olympic and Paralympic Games in 2020.

(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 activities, suspicious boats needs to be stopped for boarding inspection and if crime is discovered, it needs to carry out a proper criminal investigation. For this reason, in response to suspicious vessels and spy ships, the Japan Coast Guard which is a police organization deals with them as the primary agency in

cooperation with relevant government agencies.

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

(4) Promoting Measures against Maritime Crimes

Examples of recent trends that we are seeing in terms of maritime crimes include cases in which domestic poaching is carried out by poachers and buyers working in tandem and cases in which funding is provided by crime syndicates. Environmental offences, such as cases in which waste products are illegally dumped into the ocean to avoid having to pay for treatment costs, continue to be perpetrated. These offenses are becoming more aggravated and increasingly sophisticated. Cases in which foreign fishing vessels are found to be illegally operating continue to arise. Some vessels operate unlawfully under cover of darkness to evade control. Such cases are also becoming more aggravated and increasingly sophisticated. International criminal organizations are also getting involved in the smuggling and the stowaway. Regarding various maritime crimes, there is still a need for vigilance and Japan Coast Guard is strengthening surveillance and law enforcement, gathering and analyzing crime information, and strengthening boarding inspections by effectively utilizing patrol vessels and aircraft as well as sharing information with relevant domestic and foreign organizations as part of the efforts to pursue effective measures and take strict yet appropriate measures against maritime crimes.

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, 2017 in April 2015. In response to nuclear testing conducted in January 2016 and the launching of a ballistic missile referred to as a 'satellite' in February of the same year, a Cabinet decision was made based on the same Act on the nineteenth day of the same month to bar any third-country ships verified through procedures set forth under Japanese law as having made a port of call in North Korea from entering a Japanese port. 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., close coordination with relevant administrative agencies is promoted to ensure the effectiveness of measures stipulated by the law.

Based on the repeated occurrences of North Korean transgressions, contingency measures have been thoroughly taken to fortify response systems, including those harnessed for the collection and transmission of information. A system for monitoring and keeping track of North Korea remains in effect. Even in the wake of nuclear testing conducted on January 6, 2016 and the launching of a ballistic missile referred to as a 'satellite' on February 7 of the same year, ministerial directives called for the collection of information and the provision of necessary information to ensure the safety and security of the people.

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

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

5 Infectious Disease Measures

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

For countermeasures against pandemic influenza and new infectious diseases, 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) Registered business operations eligible for prior vaccination must continue to carry out business activities that contribute to the stability of citizen’s lives and economy even during outbreaks, and 3) designated public institutions are required by regulation to implement measures against breakouts of new type influenzas, etc., and designated public institutions that serve as transport operations must establish individual business plans in the event of new type influenzas, etc., emergency situations and carry out necessary measures to appropriately implement the transport of passengers or cargo.

In June 2013, the National Action Plan for Pandemic Influenza and New Infectious Diseases of JAPAN (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.

Chapter 8 Creating and Preserving a Beautiful and Healthy Environment

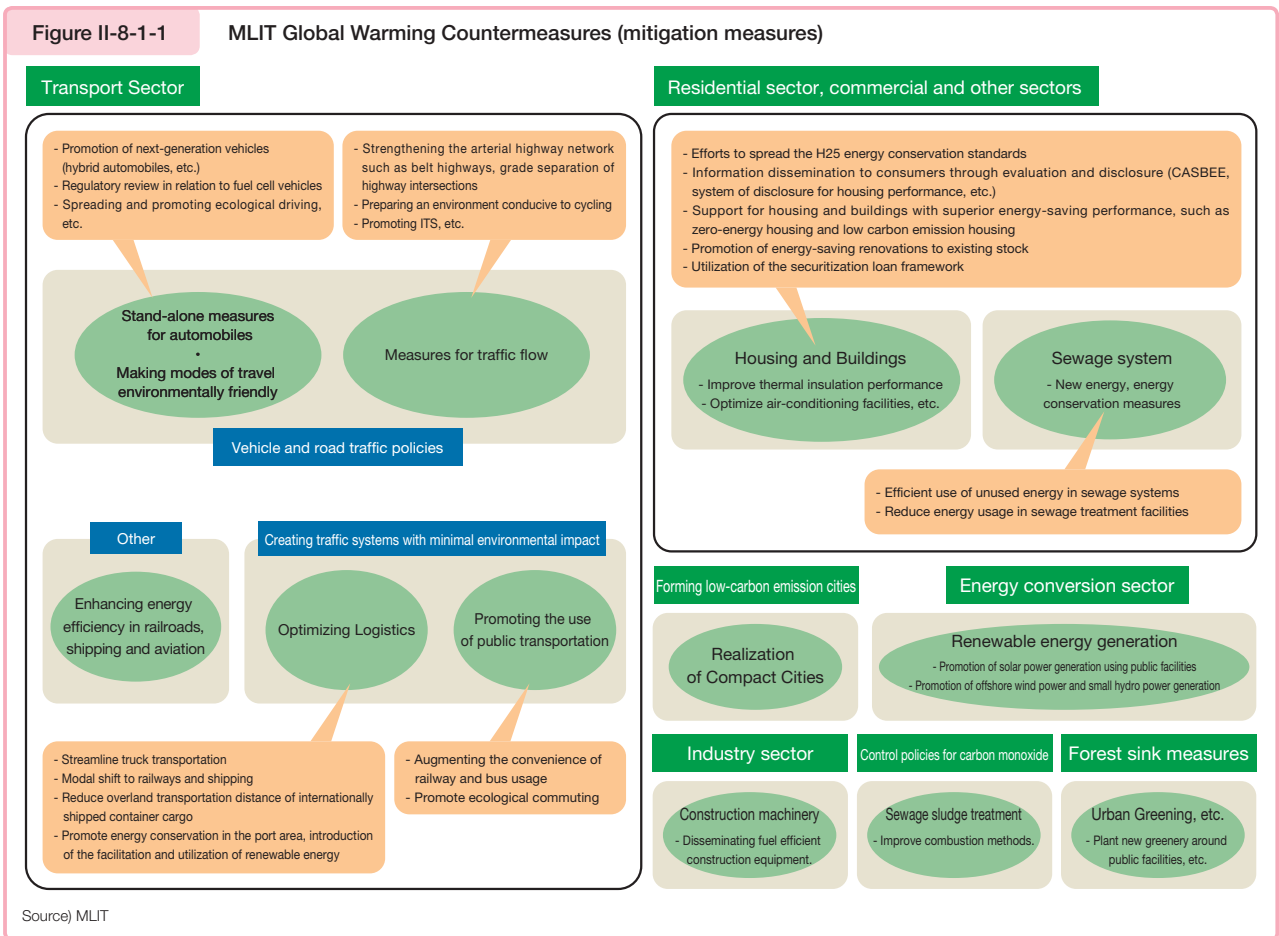
Section 1 Promoting Global Warming Countermeasures

1 Implementing Global Warming Countermeasures

At the twenty-first session of the Conference of the Parties to the United Nations Framework Convention on Climate, change (COP21) which was held in Paris, France, in December 2015, the Paris Agreement was adopted as a new international framework for reducing greenhouse gas emissions to replace the Kyoto Protocol.

Based on the Paris Agreement, Japan was called upon to formulate “the Plan for Global warming Counter measures” by the spring of 2016. In response, the MLIT studied global-warming countermeasures (mitigation measures) to be incorporated into a new plan according to discussions held by the Council for Infrastructure Environment Committee and the Council for Transport Policy Transport System Subcommittee ; Environment Committee.

Even if mitigation measures were to be implemented to the maximum extent possible, it is widely believed that the impact of climate change cannot be completely avoided. As the importance of implementing adaptation measures to prepare for the negative impact of climate change has been indicated, we will promote adaptation measures to the utmost in addition to adopting energy-conservation measures and ushering in an era of renewable energy.



2 Promoting Global Warming Countermeasures (Mitigation Measures)

(1) Promoting Low-carbon City Development

In urban areas with a considerable concentration of human residents and buildings, low-carbon urban development plans produced by municipalities according to “The Low- Carbon City Act”, which came into force from the standpoint of the desire to advance “low-carbon urban development” in accordance with the consolidation of urban functions, the promotion of the use of public transit in connection with this consolidation, and the promotion of green conservation and greening initiatives, came to be formulated by twenty-two cities by the end of fiscal year 2015. “Low-carbon urban development” will continue to be promoted for initiatives under these plans through statutory special measures, taxation systems, fiscal measures, and other means.

(2) Promoting the Development, Distribution and Optimal Utilization of Environment-friendly Vehicles

a. Improving Mileage of Vehicles

Based on the Law Concerning Rational Use of Energy (Energy Saving Act), we are formulating fuel economy standards and disclosing fuel consumption for automobiles. We established the Automobile Fuel Economy Standards Subcommittee (a subordinate committee operating under the Council of Transport Policy) and have summarized the results of discussions pertaining to the introduction of the Worldwide Harmonized Light vehicles Test Procedures (WLTP).

Furthermore, the average fuel efficiency rate of gasoline passenger vehicles released in FY 2014 was approximately 4% higher compared to FY 2013, and we will continue in the efforts to further improve fuel efficiency.

b. Framework for promoting improvements in fuel efficiency

A program for evaluating and publicizing performance in terms of the fuel efficiency of automobiles is being run to make it easier for consumers to identify and select vehicles that offer exceptional performance in terms of fuel efficiency. Stickers are affixed to vehicles to enable fuel performance in terms of fuel efficiency to be outwardly discerned by consumers.

c. Promoting the dissemination of environment-friendly vehicles

After reviewing conditions for receiving eco-car tax reductions (vehicle weight tax and automobile acquisition tax) for an automobile offering excellent environmental performance (eco car) under the FY 2015 taxation system revisions, we implemented measures for obtaining preferential treatment in connection with the tax system by extending these tax reductions by two years and establishing a greening exemption tied to the light motor vehicle tax to go along with an exemption tied to the vehicle tax.

We are promoting urban development based on the use of environmental vehicles by providing subsidies for the acquisition of fuel-cell vehicles, electric vehicles, and micro-mobility vehicles from the standpoint of promoting global warming countermeasures. In addition, subsidies are being granted to truck and bus business operators for the acquisition of CNG automobiles ^{Note}, hybrid vehicles, and advanced environmental diesel trucks.

d. Development, application, and creating a usage environment for next generation heavy vehicles

Since FY 2015, we have been pursuing scientific research to promote the development and commercialization of technologies relating to high-efficiency next-generation diesel engines and next-generation large-sized vehicles known as large-sized liquefied natural gas automobiles from the standpoint of reducing carbon footprints and emissions.

Note Compressed Natural Gas Vehicles (Natural Gas Automobiles)

e. Promoting and disseminating ecological driving

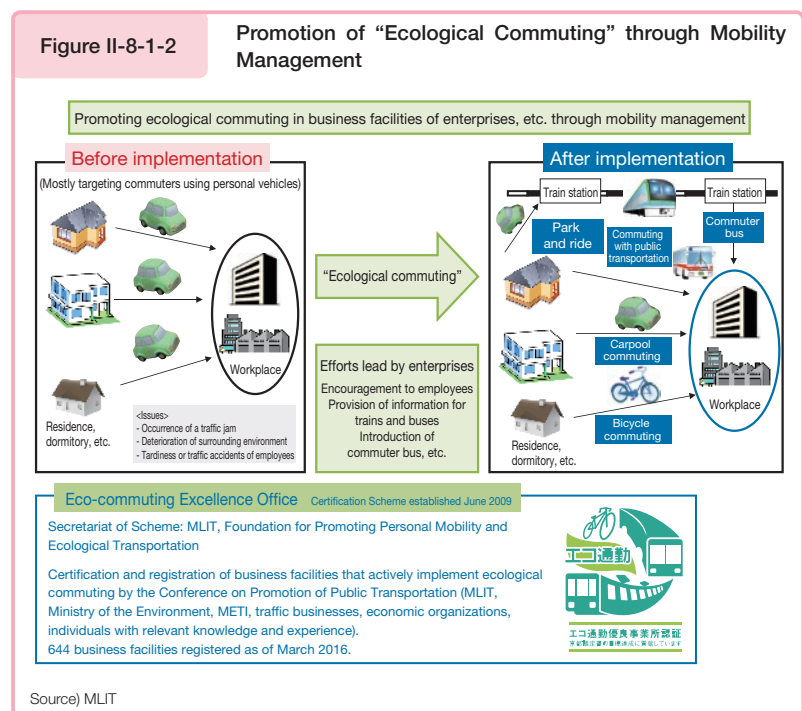
MLIT has promoted holding symposiums and events all over the country in cooperation with the relevant ministries and agencies of the government and the District Transport Bureaus. We also worked on promoting and spreading ecological driving based on the “10 Reasons for Driving Ecologically”. Furthermore, in order to promote and disseminate ecological driving by the Automobile Carrier businesses, MLIT supports the introduction of the Ecological-driving Management System (EMS) ^{Note 1}.

(3) Promotion of traffic flow improvement

Various traffic flow measures are being tried, since improving the driving speed by smoothing the traffic flow will improve the actual as mileage rate and decrease the carbon dioxide emissions from automobiles. Specifically, we are developing ring roads and other arterial road networks that are effective in reducing through-traffic in the urban center by providing them with alternate routes, working on grade separation of intersections and promoting serial railroad grade-separation projects to eliminate unopened grade crossings. In order to realize smooth, safe transportation services, we are also promoting initiatives for enabling roads to be used smartly, such as by contributing to the optimal use of existing networks through the use of ETC 2.0, a program for which full-scale adoption efforts have begun. We also work on providing improved road space for cyclists. In order to reduce carbon footprint, LED road lights are being introduced.

(4) Promoting the use of public transportation

The shift from private vehicles to public transportation reduces travel with vehicles and is a necessary facet of global warming countermeasures. For this reason, we are helping to promote the introduction of public transit IC cards and other computerization initiatives, make public transportation more convenient through the introduction of an LRT/BRT system and improvements to transfers and popularize ecological commuting at the business establishment-level through a scheme to certify offices for excellence in eco-commuting. Furthermore, information analysis and validation results of past activities for the Environmentally Sustainable Transport (EST) Model Project were provided nationwide to regions working to realize EST.



(5) Optimizing logistics

Exceeding 50% of the total domestic transportation modes in Japan, trucks account for the majority of the share ratio (ton kilometer basis in transportation). The CO₂ emissions base unit ^{Note 2} of trucks is greater than that of mass transportation such as railroads and domestic shipping, and trucks account for 90% of the CO₂ emissions in logistics. In order to reduce CO₂ emissions while sustaining domestic logistics, we must strive to utilize energy efficient transportation modes such as railroads and domestic shipping in addition to improving energy efficiency and transportation efficiency of trucks. With a view to establishing an efficient system of logistics with a lower environmental impact, we are providing support for initiatives concerning joint transportation, modal shifts, efforts to promote the dissemination of large CNG trucks and

Note 1 Plan for the implementation of planned and continuous ecological driving of motor vehicles with the integration of evaluation and guidance.

Note 2 The amount of CO₂ emitted by shipping 1ton of cargo for a distance of 1km.

other environmental vehicles, a smaller carbon footprint generated by logistical sites, and a smaller carbon footprint generated by ports and harbors. We are also promoting the dissemination of equipment containing natural coolants for use in warehouses for frozen and refrigerated goods. In addition to studying a matching framework for the promotion of joint transportation, promoting the use of containers on a round-trip basis, developing low-floor freight cars to accommodate the shipping of forty-foot tall containers by rail, and providing subsidies for the acquisition of thirty-one-foot containers for railways that are equivalent in size to ten-ton trucks, we are also promoting the construction of energy-saving vessels and otherwise invigorating the coastal shipping and ferry sector. We also work to disseminate the Eco Rail Mark (161 products (199 items) and 86 cooperating enterprises certified as of the end of August 2015), and the Eco Ship Mark (94 consignors and 110 logistics businesses enterprises certified as of the end of February 2015). In ports and harbors that are a hub for maritime transportation and overland transportation, we are endeavoring to reduce overland transportation distances for cargo by promoting the development of international maritime container terminals, development of international logistics terminals, and development of domestic logistics sites compatible with combined multimodal transportation. In ports and harbors, we are also engaged in efforts to support the introduction of energy-saving systems, promote modal shifts and transportation streamlining based on the use of marine transportation for reverse logistics facilitate the introduction and promote the use of recyclable energy, develop green tracts to contribute to CO₂ absorption, and create seaweed beds and other such ecosystems.

In addition, in cooperation with the relevant ministries and related organizations, we hold the Green Logistics Partnership Conference to give awards to the excellent operations through the collaboration of logistics operators and shipping companies and to raise public awareness.

Figure II-8-1-3

Promotion of Activities through the Green Logistics Partnership Conference



Green Logistics Partnership Conference (Manager: Takehiko Sugiyama, Vice-Director General of the Institution for Transport Policy Studies and Director-General of the Institute for Transport Policy Studies)

- This conference was launched as a conference for promoting awareness of the importance of green logistics and stimulating interactions among cargo owners, logistics companies, and other concerned parties in order to advance CO₂ reductions in the logistics sector. Since FY 2015, this conference has been promoting not just initiatives to reduce amounts of CO₂ emissions but also initiatives to reduce other burdens on the environment, improve the productivity of logistics, and otherwise contribute to the establishment of sustainable systems of logistics.
- Organized by: Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Economy, Trade and Industry; Japan Federation of Freight Industries, Japan Institute of Logistics Systems Supported by: Japan Federation of Economic Organizations
- Established: April 2005
- Membership: 3,353 members (as of February 17, 2016) --- Logistics Companies, Cargo Owners, each of the industry associations, think tanks, research institutes
- Introduction and commendation of excellent businesses as well as holding discussions regarding Green Logistics aimed towards the expansion of voluntary efforts in the private sector aimed at reducing CO₂ emissions.

Summary of the awarded enterprises

[Purpose] To encourage enterprises to autonomously engage in initiatives and promote the dissemination and growth of the concept of green logistics by recognizing meritorious achievements in connection with initiatives carried out to successfully reduce burdens on the environment in the logistics sector, improve the productivity of logistics, or otherwise establish a sustainable system of logistics.

[Types of Awards] Ministers Award, Director-Generals Award, and a Special Award have been created.

Ministers Award --- Award from Minister of Land, Infrastructure, Transport and Tourism Award; Award from Ministry of Economy, Trade and Industry

Director-Generals Award --- Award from Ministry of Logistics Deputy from the Ministry of Land, Infrastructure, Transport and Tourism Secretariat; Award from Ministry of Commerce and

Distribution Safety Deputy from the Ministry of Economy, Trade and Industry Secretariat

Special Award --- Award on the level of the Ministers Award and the Director-General Awards for particularly superior initiatives (created in 2013)

Example of a case awarded by the Ministry of Land, Infrastructure, Transport and Tourism (In 2014)

◆ Award from Minister of MLIT

Initiative Name: Endeavoring to promote comprehensive green logistics accompanying a modal shift; aiming to standardize palletizing operations and establish a diversity-oriented logistics network in anticipation of a driver shortage.

Companies: Kobe Modal Shift Promotion Council, Nestle Japan, Ltd., Zenkoku Tsu-un Co., Ltd., and Japan Freight Railway Company

◆ Award from Ministry of Logistics Deputy of the Ministry of Land, Infrastructure, Transport and Tourism Minister's Secretariat

(i) Initiative Name: Reducing burdens on the environment by way of the efficient operations of transportation businesses and reduced amounts of CO₂ generated by these businesses through greater collaboration in the area of trunk-line shipping, the shared use of facilities, the joint administration of collection and delivery work, and the sharing of IT systems.

Companies: Tonami Transportation Co., Ltd., Daiichi Freight System, Inc., Kurume-Trans Co., Ltd.

(ii) Initiative Name: Supporting initiatives to reduce burdens on the environment through operations of Yamaya Shoryu's distilled spirits center and next-generation modal shift.

Companies: Yamaya Shoryu Corporation, Senko Co., Ltd., Japan Freight Railway Company, Kokura Transportation Co., Ltd., Sendai Express Co., Ltd., SBS Logicom Co., Ltd., Japan Oil Transportation Co., Ltd.

◆ Special Award from Green Logistics Partnership Conference

Initiative Name: Project to implement measures to deal with shortages of long-haul drivers and reduce amounts of CO₂ emission through the use of marine and rail modes of transportation.

Companies: Nippon Express Co., Ltd., Fujifilm Logistics Co., Ltd., MOL Ferry Co., Ltd., Japan Freight Railway Company



Award granted by the Minister of Land, Infrastructure, Transport and Tourism: standardization of palletizing operations



Award granted by the Minister of Land, Infrastructure, Transport and Tourism

(Source) MLIT

(6) Promoting low carbonization of railways, ships, and aviation

a. Initiatives contributing to further enhance environmental performance in the railway sector

While rail has a smaller environmental impact than other modes of transportation, we are promoting the adoption of railroad-related facilities tied to the Ministry of the Environment and systems that help railway carriages generate a smaller carbon footprint and save energy and promoting the development of technologies to help improve environmental

performance in order to further reduce the impact that rail has on the environment.

b. Initiatives for energy conservation and low carbonization in shipping

We are promoting energy conservation for ships in the area of coastal shipping by advancing the construction of vessels that contribute to energy conservation and supporting the demonstration of innovative energy-saving technologies. From the standpoint of advancing the development of an international framework and disseminating and promoting the development of technologies on an integrated basis in the area of international shipping, we have been supporting the private-sector development of technologies for the purpose of further reducing CO₂ emissions from vessels since FY 2013 and spearheading IMO discussions on progressively fortifying regulations governing CO₂ emissions (fuel-efficiency regulations) and on creating an international framework that includes a program for reporting fuel efficiency (by which fuel efficiency during actual operations can be visualized).

c. Initiatives to reduce CO₂ emissions in aviation

We are advancing the implementation of area navigation (RNAV), which enables shortening flight time and distance and the User Preferred Route (UPR) method, which allows the flight to have the most efficient altitude desired by the pilot, as well as enhancing aerial traffic systems by implementing the Continuous Descent Operation (CDO) which sustains minimal engine output by continuously descending without leveling out at any point during descent. We also promote the use of ground power units (GPU) for airplanes and ecological cars such as Ground Service Equipment (GSE) vehicles as a part of Eco Airport (eco friendly airport) activities. Furthermore, we are strengthening international initiatives, such as participating in the Asia and Pacific Initiative to Reduce Emissions (ASPIRE) where air traffic control authorities and airline companies cooperate to attain efficiency in flying. We are also leading the discussion to develop a global scheme to reduce CO₂ emissions from international aviation. Furthermore, the efforts to promote the use of alternative aviation fuels are being conducted, collaborating with the various stakeholders.

(7) Enhancing energy-saving capabilities in housing and buildings

The rise in the amount of energy consumed by the civilian sector is more prominent than in other sectors, which makes improving energy-saving capabilities in housing and buildings an urgent task.

In response to the fact that the basic energy plan will progressively mandate that new dwellings and buildings comply with energy-saving standards by 2020, the Act for Improving the Energy-Consumption Performance of Buildings (Building Energy-Saving Act), which sets forth measures for mandating compliance with energy-saving standards on the part of buildings above a certain size other than dwellings and measures with respect to a program for certifying buildings demonstrating excellent energy-saving performance and a program for indicating energy-saving performance, was promulgated in July 2015.

In order to communicate energy-saving performance to consumers in an easy-to-understand manner, efforts are underway to upgrade and disseminate a housing-performance indication system, CASBEE, the Building Energy-efficiency Labeling System (BELS), and other such programs.

Aside from this, in order to promote energy saving/decreasing CO₂ emissions for housing and buildings, MLIT is supporting various efforts, such as businesses that award points—which can be exchanged with various merchandise—for building new eco-housing or doing eco-reforms, the introducing of cutting-edge CO₂ emissions decreasing technology and energy conserving renovation, as well as efforts by small and medium-sized contractors in building zero energy housing and certified low-carbon housing and buildings, while also lowering the interest rate by using the Japan Housing Finance Agency's securitization support business framework. In addition, it is working for the development and dissemination of things like the design and construction technology of energy-saving houses and buildings through holding workshops for design and construction professionals and providing support for the technological development of the leading private firms.

Furthermore, in order to stimulate energy-saving measures in pre-existing establishments, we are formulating supportive taxation measures for renovation work towards energy conservation in already existing residences and buildings.

(8) Promotion of energy-saving methods in sewage

The reduction of carbon monoxide is being advanced by the implementation of energy-saving measures such as high

efficiency equipment for sewage treatment, and with new energy measures such as the processing of raw sewage into solid fuel, and the high temperature incineration of raw sewage.

(9) Promotion of environmental measures for construction machinery

MLIT is implementing a system that gives type approval for construction machinery, such as hydraulic shovels and bulldozers, that meet the fuel consumption standards for major construction machinery. In addition, we support the purchasing of construction machinery that has been certified by said system by things such as low-interest financing plans.

(10) Implementation of CO₂ sink measures through urban greening

Urban greening is considered re-vegetation activities, which is subject to the greenhouse gas sink reports according to the Kyoto Protocol. Based on the basic plans for greening as formulated by the municipalities, we are promoting maintenance of city parks and the greening of communal facilities and private land, such as roads and ports.

MLIT is also working on public awareness regarding the meaning and effect of CO₂ sink measures by making cities more low carbon and green by alleviating the heat island phenomenon through improvement in the thermal environment by things like improving ground covering.

3 Promotion of the Use of Renewable Energy

According to the “Energy Master Plan” which was approved by the Cabinet in April 2014 and based on the fact that that the introduction of re-usable energy is being expedited as much as possible for three years starting in 2013, MLIT is promoting use of the re-usable energy potential in extensive infrastructure spaces like airport facilities, as well as rivers and streams, and the stable yet abundant sewage biomass.

(1) Promotion of the use of marine renewable energy

Surrounded by the sea on all sides, Japan is blessed with abundant sources of marine renewable energy. Offshore wind-power generation is especially expected to grow and expand in the future and ports and harbors in particular are garnering attention as sites for the installation of wind-power generation facilities.

To this end, the Port and Harbor Bureau released a manual outlining the installation process in June 2012 and draft technical guidelines that can be technical determination standards to be applied when conducting screening for the granting of permission for the proprietary use of a water area in March 2015. In FY 2015, efforts were undertaken to create a system for determining, through public participation, parties able to apply for the proprietary use of areas corresponding to ports and harbors with a view to promoting the smooth installation of offshore wind-power generation facilities in ports and harbors. Operational guidelines have also been formulated along these lines.

For marine energy such as wave and tidal power, MLIT is working on guidelines to secure the safety/environmental aspects of floating power generating facilities and promoting the realization of new re-useable marine energy in cooperation with the concerned government ministries.

(2) Promoting small hydroelectric generation

As initiatives toward a low carbon society, the implementation of small hydroelectric generation by using rivers is being pushed forward. Specifically, MLIT is working on the thorough use of unused energy by the promotion of subsidiary power generating based on a registration system, providing project formation support by field contact points, and support for the introduction of small-scale hydropower facilities at sediment control dams, as well as the proactive introduction of power generation facilities for dam management at dams directly controlled by MLIT.

(3) Promotion of the use of Sewage Biomass

The MLIT is promoting the use of energy derived from sewage sludge and the use of sewage heat.

In May 2015, the Sewerage Act was amended, thereby allowing heat exchangers to be attached to sewage conduits by private businesses and mandating efforts to be undertaken by sewage administrators to reutilize sewage sludge as a source of energy or fertilizer. Through the use of PPP/PFI, we will promote the energy utilization of sewage sludge by the use of

bio-gas and solid fuel, as well as the use of sewage heat as renewable energy heat.

Column

Hydrogen production from sewage sludge, which can power cars!

The Sewerage Law amended in May, 2015, incorporates the obligation of public sewerage system administrators to make efforts to utilize sewage sludge as energy. The utilization of sewage sludge energy includes biogas power generation, solid fuel production, etc., but in recent years, the hydrogen production from sewage sludge has attracted attention.

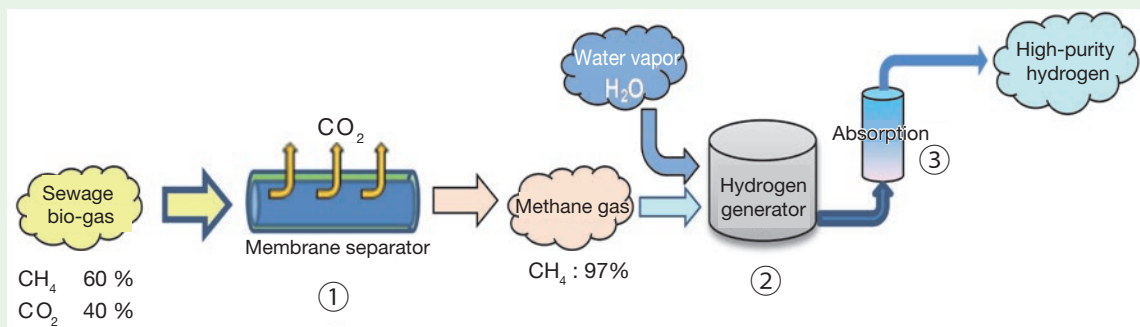
The sewage sludge-derived hydrogen has various merits in multiple aspects, such as reduction of environment loads because hydrogen production from fossil fuel emits CO₂, and contribution to local production and local consumption of energy through the use of regional resources, so people place big hopes on the hydrogen production from sewage sludge.

■ Efforts to produce and utilize hydrogen from sewage sludge :

[Hydrogen Leader City Project - Demonstration of hydrogen generation from sewage biogas source -]

Under this project, four parties, including Mitsubishi Kakoki Kaisha, Ltd., Fukuoka-city, Kyushu University, and Toyota Tsusho Corporation, have constructed facilities at real-scale level for demonstrations and been conducting verification tests on whether hydrogen can be stably produced from sewage sludge. They have also been studying the use of CO₂ generated in the process.

The project started in FY 2014, and so far, the test results have shown stable production of hydrogen.



[Consideration of the use of hydrogen derived from sewage sludge]

In the “Review Committee on the utilization of sewerage resources in ‘Hydrogen Society’”, convened in FY 2015, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) carried out feasibility studies on the production and utilization of hydrogen from sewage sludge, while using wastewater treatment facilities of Hirosaki-city, Saitama prefecture, and Yokohama-city as models, and had discussions on issues in technical, institutional, and financial aspects, and on the solutions.

■ Future initiatives

The amount of biogas generated from sewage sludge in FY 2013 was approximately 330 million Nm³, but approximately 30% (89 million Nm³) was just incinerated, so the gas is not fully effectively used. If producing hydrogen from the unused biogas, the amount would be equivalent to that which can fill fuel cell vehicles 2.7 million times. Like this, the hydrogen production from sewage sludge has a great potential.

MLIT promotes efforts toward realization of supply and utilization of hydrogen from sewage sludge, one of renewable energy, through support for technology development, for project formulation by feasibility studies, and for commercialization.

MIRAI, a hydrogen fuel cell-powered car, and a hydrogen fueling station



Source) MLIT

(4) Promotion of Solar Power Generation using Infrastructure Space

Based on the changes in energy supply and demand triggered by the Great Eastern Japanese Earthquake, and in addition to the effective utilization of the vast spaces of sewage treatment plants, ports and harbors, and airport facilities, steps have been taken to insure the installation and placement of solar power generation facilities by public entities in public infrastructure spaces, such as government buildings and railway stations, and for private businesses that can install such facilities in roads and urban parks.

(5) Promotion of contribution towards the hydrogen society

With the need for hydrogen energy expected to expand in the future, such as fuel cells for residential use (introduced to the market in 2009) and fuel-cell cars (introduced to the market in 2014), MLIT is working on realizing a hydrogen energy fueled society by preparing a conducive environment for the manufacturing, storage/transportation and usage of hydrogen.

a. Promotion of dissemination of fuel-cell cars

To work towards the world's fastest dissemination of fuel-cell cars, MLIT will support fuel-cell car introduction projects by private businesses. MLIT will also steadily pursue the technological development of hydrogen energy, as it is important to achieve early utilization of things like fuel-cell buses and fuel-cell forklifts, as they are projected to create a relatively consistent demand for hydrogen.

b. Initiatives for the commercialization of vessels powered by hydrogen fuel cells

We are developing a foundation for enabling private-sector companies to participate in efforts to promote the use of hydrogen in the maritime sector, such as by conducting studies on the commercialization of hydrogen fuel cell-powered vessels with exceptional environmental capabilities and formulating safety guidelines.

c. Setting up the marine transportation system for liquefied hydrogen

Since FY 2015, Kawasaki Heavy Industries and other companies have been producing hydrogen through the use of brown coal, an unutilized energy source in Australia, and implementing a project to establish a supply chain for transporting liquid hydrogen to Japan in connection with a project implemented by the METI to verify the establishment of a supply chain for hydrogen derived from unutilized energy sources.

To this end, the MLIT has, in conjunction with these initiatives, spearheaded efforts to set global safety standards needed for the safe marine transportation of liquid hydrogen on a multilateral basis through the IMO (International Maritime Organization). In order to establish a safe, highly efficient method of loading and unloading liquid hydrogen, energy carriers associated with the Strategic Innovation Promotion Program (SIP) have been engaging in research and

development since FY 2014 on loading systems for liquid hydrogen in collaboration with the Cabinet Office.

4 Promotion of Global Warming Countermeasures (Adaptation measures)

In order to comprehensively and systematically promote initiatives that are consistently backed by the entire government in response to the various consequences of climate change, the first national plan for adaptation to the impact of climate change was adopted by Cabinet decision in November 2015.

As the role ascribed to adaptation measures put forth by the MLIT, which has jurisdiction over the maintenance of national land and other areas and which is in charge of the safe and secure development of national land and regions, is considerable, the MLIT climate change adaptation plan, which summarizes adaptation measures to be implemented by the MLIT, was formulated and publicly released on the same day as the adaptation plan put forth by the government.

While the MLIT has proactively promoted measures for dealing with river water flooding, inland water flooding, sediment-related disasters, storm surges, droughts, and other water related disasters as part of adaptation measures taken to date, adaptation measures that are comprehensive in both structural and non-structural terms shall be studied and deployed based on the formulation of the MLIT climate change adaptation plan.

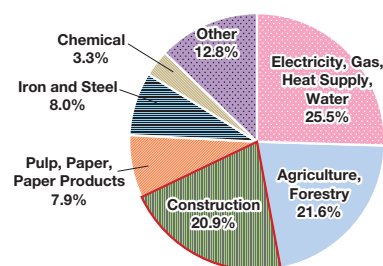
Section 2 Promoting the creation of a recycling society

1 Advancing recycling in construction

Construction waste accounts for approximately 20% of all industrial waste, and 20% of final disposed amount. Suppression of the generation of construction waste, and recycling and reuse of those waste are major tasks. In FY 2012, approximately 73 million tons of construction waste was generated nationwide. The recycling/reduction rate stood at 96.0 percent, which is higher than it was for other industrial sectors. Despite such positive results, certain issues will need to be addressed at this point in time, including an increase in the amount of construction by-products generated by maintenance and renovation work required to prop up aging social infrastructure and by construction work relating to the Tokyo Olympic and Paralympic Games and an increase in the amount of construction-generated soil derived from large-scale tunneling projects.

Sewage sludge also accounts for 20% of all industrial waste, reaching approximately 77 million tons in FY 2013. We are working on recycling and reduction of sewage sludge.

Figure II-8-2-1 Amount of Industrial Waste by Industry Sector and Recycle Rate of Construction By-products



Source) Prepared by the MLIT from "Status on Production and Disposal of Industrial Waste" (FY2013 results) of the Ministry of Environment

Subject materials	Index	2005Performance	2008Performance	2012Performance
Asphalt, concrete clusters	Recycle rate (%)	98.6	98.4	99.5
Concrete clusters		98.1	97.3	99.3
Construction generated wood	Recycling and reduction rate (%)	90.7	89.4	94.4
Construction sludge		74.5	85.1	85.0
Construction mixed waste	Produced amount (ten thousand tons)	293	267 (6% decrease in comparison to 2005)	280 (5% decrease compared to 2005)
Total construction waste	Recycling and reduction rate (%)	92.2	93.7	96.0
Construction generated soil	Efficient utilization rate (%)	80.1	78.6	88.3

*Reduction refers to reducing the amount of waste through incineration, dehydration, or other processes.

Source) MLIT "2012 Construction By-products Status Survey"

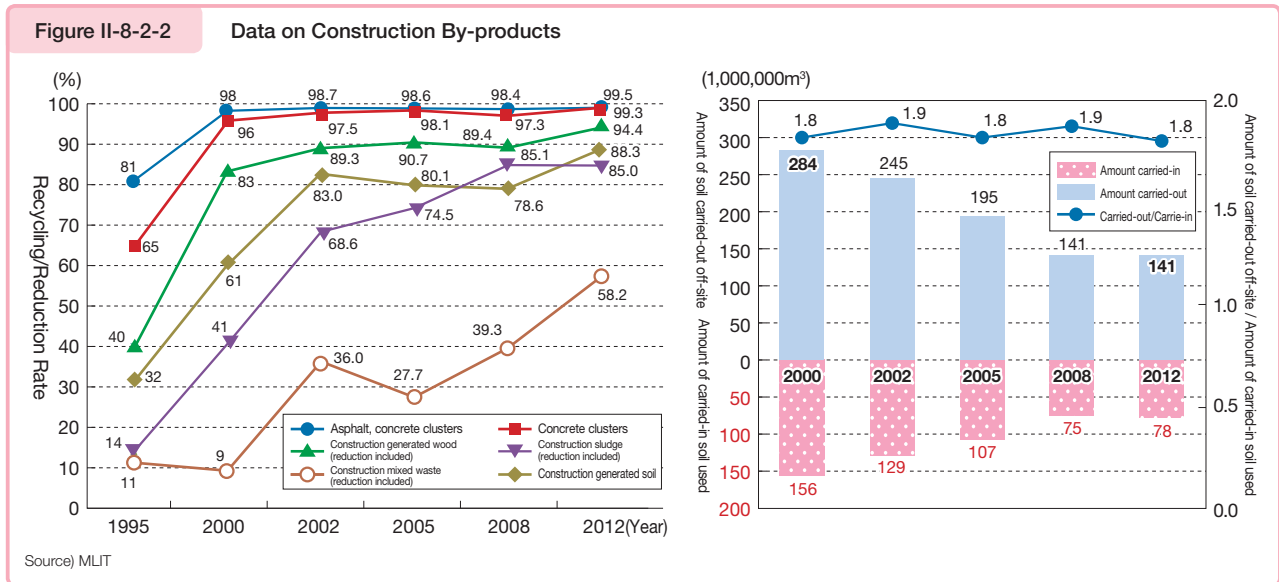
(1) Advancing recycling in construction

Based on the "Construction Material Recycling Act (Construction Recycling Law)", we are working to enforce proper measures through a simultaneous patrol throughout Japan.

In the "Construction Recycling Promotion Measures Subcommittee" that have been formed in both the Environment Committee of the Panel of Infrastructure Development and the Environment Committee of the Transport System Section of the Council for Transport Policy, the relevant parties involved in construction recycling put together the "Measures related to the Promotion of Construction Recycling", a recommendation to promote mid-term objectives for the recycling

and appropriate disposal of construction by-products for the future, and MLIT formulated the fourth action plan, the “2014 Construction Recycling Promotion Plan” in September 2014.

According to this plan, the MLIT will be promoting construction recycling by working on fortifying the monitoring of construction by-products distribution, inhibiting occurrence before the start of construction, promoting recycling/reduction by thorough on-site sorting and delivery to recycling facilities, promoting use of recycled materials, and promoting the efficient use and appropriate disposal of construction sludge.



(2) Reducing sewage sludge and promoting recycling

MLIT is promoting the recycling of sewage sludge (FY 2013 recycle rate 62%) and moving forward with the use of sewage sludge made into solid fuel for energy, as well as the recovery and use of phosphorus from sewage sludge. Furthermore, we are proceeding with the Breakthrough by Dynamic Approach in Sewage High Technology Project (B-DASH Project) for proving innovative technology and systems for the effective use of sewage based resources.

2 Constructing a resource recycling logistics system

(1) Forming a resource recycling logistics system by utilizing shipping

In order to form the “loop” of reusable resources for creating a recycling society, MLIT have specified 22 ports throughout Japan as Recycle Ports (Integrated Reverse Logistic Base Port) for wide-spread flows concerning reusable resources. At the Recycle Ports, they undertake activities such as securing coastal facilities like wharfs, aiding in establishing facilities for handling reusable resources, promoting the public-private partnership, and improvements in operations related to handling reusable resources. MLIT have partnered with the Ministry of the Environment to engage in efforts to promote modal shifting and lower the carbon footprint and costs of reverse logistics through improvements in transportation efficiency through the “Project to Promote Low-Carbon Type Reverse Logistics by Model Shift / Transport Efficiency”. In addition, as a participating member of “Disaster Waste Treatment Support Network (D-Waste-Net)” the Council to Promote Recycling Ports has been appointed by the Minister of the Environment.

Figure II-8-2-3 Specified Recycle Ports

Recyclables Handling Support Facility

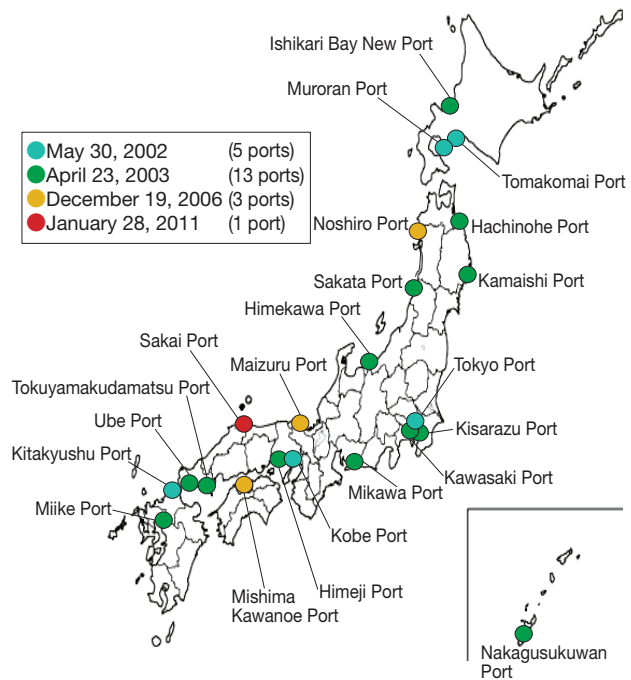


(Guard-fenced, tire-washing, and water-collecting facility)



(Storage facilities for contaminated soil, etc.)

Source) MLIT



(2) Systematic acquirement of bay area landfill sites for waste

Bay area landfills are being prepared in order to receive dredge soil produced by harbor improvement, or to receive waste materials that have difficulty finding final landfill sites. In the Osaka Bay area in particular, regional waste disposal sites are being developed to receive waste generated around the Osaka Bay area through the Osaka Bay Phoenix Project [Note 1](#). Construction-generated soil generated in the Tokyo Metropolitan Area is transported by sea and used widely for land-reclamation purposes in ports and harbors across the country in accordance with the Super Phoenix Plan [Note 2](#).

3 Recycling vehicles and marine vessels

(1) Recycling vehicles

In accordance with the Act on Recycling, etc. of End-of-Life Vehicles (Act for automobile recycling), a system for confirming that end-of-life vehicles are scrapped, is being implemented. Where a deletion of vehicle registration as provided for in the Road Transport Vehicle Act is undertaken, the vehicle weight tax that had been levied on the used vehicle will be subject to a refund program. We are endeavoring to promote the proper disposition of used vehicles and prevent illegal dumping. In FY 2014, vehicles confirmed to have been scrapped numbered 1,463,151.

Note 1 Business to promote the orderly development of the port by properly disposing in the sea landfill the waste generated from the 2 cities, 4 prefectures and 168 municipalities of the Kinki region.

Note 2 A Mechanism for adjusting at the national level, the soil from construction in metropolitan areas to use it effectively as resources for port construction in ports that need landfill materials.

(2) Recycling marine vessels

The recycling of large vessels (ship recycle) ^{Note 1} has generally been conducted in developing nations such as Bangladesh and India, where the frequent occurrence of human casualty accidents and marine pollution in the facilities continue to raise concern. In order to solve these issues, Japan lead discussions with the International Maritime Organization (IMO), which resulted in the adoption of the “2009 Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships (tentative name) (Ship Recycling Convention)”. This convention mandates the inspection and retention of proof documents for marine vessels and ship recycling facilities respectively, and also bans the use of asbestos or polychlorinated biphenyl (PCB) in newly built vessels.

In Japan, studies are being carried out on enacting domestic laws required for conclusion of the Ship Recycling Convention with the aim of enforcing this convention as soon as possible. Conclusion by key recycling countries is also needed to put this convention into effect. At meetings held in 2014 and 2015 between Prime Minister Abe, representing Japan, and Prime Minister Modi, representing India—which is the world’s largest recycling country, requests were made for Japanese support concerning improvements to be made to ship recycling facilities based in India. The MLIT has extended technical support for making improvements to facilities in India and is promoting cooperation for concluding the Ship Recycling Convention. Through initiatives attributed to public-private cooperation in both countries, improvements are being made to certain facilities. In 2015, the facilities of four companies were certified as conforming to the standards as provided for in the Convention by a third-party organization (Nippon Kaiji Kyokai).

On other fronts, because privately owned pleasure boats are mostly made of fiber reinforced plastic (FRP), which is difficult to dispose, there has been a demand for a waste processing route for proper disposal. In response, we undertook activities in building a processing route, as well as developing recycling technologies for FRP boats. As a result, approximately 450 FRP vessels are properly recycled yearly under the leadership of the Japan Marine Industry Association throughout Japan since 2005.

4 Efforts in Green Procurement ^{Note 2}

In light of partial revisions to the basic government policies, based on the “Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities (Law on Promoting Green Purchasing)”, the “Policy for promoting the procurement of ecologically friendly goods, etc.” was adopted. Based on this policy, we are actively advancing the procurement of ecology-friendly goods for building materials, construction machinery, method of construction, and objectives in public construction work.

Note 1 Vessels that have reached the end of their operational use are dismantled, and the majority of the parts are re-used as steel.

Note 2 Procuring eco-friendly goods that are defined under Article 2 in the “Green Purchasing Law” is called Green Procurement here.

5 Promoting the use of wooden building materials

Because wood is an environment-friendly building material due to reasons such as requiring less energy to process in comparison to other materials, and long-term utilization in various applications contributing to preventing global warming and forming a recycling-oriented society, we strive to encourage the utilization of wooden materials in public construction.

Based on the “Act for Promotion of Use of Wood in Public Buildings”, etc., national implementation status of wood usage promotion is published every year, and the “Plan for the promotion of the use of wood in public buildings” was formulated to work on the use of wood as building materials and for the interior of buildings. MLIT is working to set up technical standards relating to designing and building, and to disseminate these standards.

In order to advance the development of wooden dwellings and buildings, various initiatives are being undertaken, such as by providing support for the development of long-life quality wooden housing and certified low-carbon housing made using local materials, zero energy houses, certified low-carbon buildings and other quality wooden buildings, and large wooden buildings incorporating pioneering design and construction technologies; developing local programs for the production of wooden housing; and training leaders.

Figure II-8-2-4

Examples of the Use of Wooden Building Material
Conference room, Hiratsuka Government Office Building



Source) MLIT

Section 3 National land development that revives and preserves the natural environment

1 Initiatives for preserving biodiversity

As efforts towards the Strategic Plan 2011 to 2020 (objective for the Aichi prefecture), adopted at the COP10 held in Nagoya city, Aichi prefecture in October of 2010, we are currently advancing activities for its achievement. Furthermore, the “National Biodiversity Strategy 2012 to 2020” was formulated in September of 2012, and we have decided to continue the advancement in activities for preserving, reviving, and creating animal habitats in rivers, urban green lands, coastal regions, harbors, and roads.

In October 2011, as reference material for municipalities formulating a basic plan for greening, the “Items for Technical Consideration in Securing Biodiversity in the Basic Plan for Greening”, which summarizes the items that need to be considered in securing biodiversity, was formulated. Further, in May 2013, MLIT formulated the “Urban Biodiversity Index (draft)” to evaluate the progress of the conditions and enforcement of biodiversity by the local governments, and is promoting the efforts of local governments to secure urban biodiversity. In March 2015, the Ministry of the Environment, together with the Ministry of Agriculture, Forestry and Fisheries formulated the “Non-native Species Damage Preventative Action Plan” in order to comprehensively and effectively promote Japan’s non-native species countermeasures as well as to protect and continually enjoy the rich biodiversity of Japan.

2 Creating rich and beautiful river environments

(1) Creating and conserving a healthy river environment

(i) Creating a rich river environment and stimulating revival

In river development, based on the “Basic Guideline for Rich River Development (established in October 2006)”, we work for the conservation and restoration of animal habitats and diverse river scenery, while concurrently sustaining safety over flood control.

While promoting the restoration of marshland by nature restoration projects and the improvement of the upstream and downstream migration environment for fish by fixing the fish passage ways, we are also promoting the protection and restoration of the watershed ecosystem with the goal of forming an ecosystem network ^{Note} by cooperating with various entities, as demonstrated in the project of rehabilitating storks to the wilds in Maruyama River (Toyooka City, Hyogo Prefecture).

Moreover, to effectively proceed with these activities, we are joining efforts with educated experts and various institutions, as well as utilizing research findings of government inspections of river areas and the Aqua Restoration Research Center, which has the largest experimental waterway in the world.

(ii) Countermeasures for non-native species in the waterways

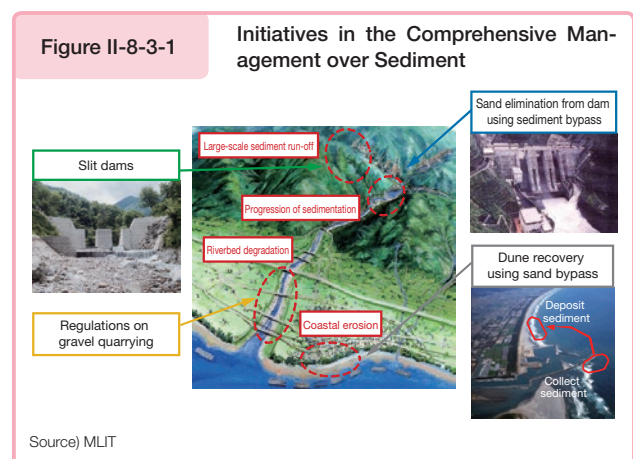
Non-native species, which are one of the threats against biodiversity, have been expanding their habitat in the waterways all over Japan. As a countermeasure, we have circulated information such as the “Guideline for Countermeasures for Non-native Plants in Rivers” and “Examples of Countermeasures for Non-native Fishes (December 2013)” and are implementing measures against foreign species in various locations.

(2) Initiatives to recover the water supply in rivers

In order to preserve a healthy river environment, it is essential to sustain a rich supply of water. For this reason, we have specified the required amount of water in the basic policies for river improvement, based on the habitat of plants and animals, scenery, and water quality. In addition to working to sustain the supply, we are proceeding with activities for clean river recovery in recession areas downstream from dams of hydroelectric power plants. Meanwhile, in order to preserve the river environment downstream of dams, flowing water is being retained in flood-control reservoirs to the extent that flood-control functions are not impeded and usable discharge dams are subject to elastic management practices and elastic management testing. (Water was retained using eighteen dams in total in FY 2015, sixteen of which were subject to the usable discharge of water.) Initiatives concerning medium-sized flash discharging to cause changes in river formations are also being undertaken. Furthermore, we are working to restore the water supply of rivers in urban areas, where the average amount of naturally flowing water has diminished, by pumping treated water from sewage plants.

(3) Promoting activities in the comprehensive management of sediment from mountains to coastal areas

Concerned that water systems will accelerate problems such as variation in river environments caused by changes in sedimentary flow, diminishing sand supplies to the coast, and coastal erosion caused by changes in littoral drift, relevant institutions are working in cooperation to comprehensively control sediment flowing down from mountains to coastal areas. Specifically, in order to deal with the problem caused by the sediment flowing in mountain streams, dams, waterways and the coasts, in cooperation with the relevant organizations, MLIT is working on projects for formulating comprehensive sediment management plans for effective sediment management and building check dams, making existing dams permeable so that sediment can be effectively washed downstream, creating an effective flow of sediment by sediment bypasses for dams, and recovering of sandy beaches by such methods as appropriate sand and gravel extraction of the waterways, sand bypass and littoral nourishment.



Note Using districts which have excellent natural conditions as core areas and by connecting them organically to ensure the appropriate placement and connections between habitat spaces.

(4) Environmental education on rivers

As natural environments close to communities, recently, rivers host a variety of activities such as environmental studies and natural experience activities. In addition, we are promoting projects and disseminating of information so children can safely learn and play by riversides. Because there are hidden dangers and proper knowledge is essential for safe activity, we cooperate with the NPO River Activities Council (RAC), a citizens' groups which played a central role in establishment, to promote the cultivation of river administrators.

Also, in order to widely disseminate environmental education on rivers in the schools, MLIT is providing information to textbook publishers to introduce environmental education projects.

○ Children's Riverside Rediscovery Project

With the cooperation of citizens' groups, educators, and river administrators, rivers are registered as Children's Riversides and receive various means of support from the Center for Supporting Children's Riverside Activities. 300 locations are registered as of the end of March 2015.

○ Riverside Fun School Project

Utilization is encouraged for riversides that are registered as Children's Riversides and undergo riverside improvements required for enhancing experiential activities. 286 locations are registered as of the end of March 2015.

○ National Aquatic Organism Study

Conducted with the goal to increase interest in rivers through a survey of life forms found in nearby rivers. In FY 2014, 59,053 people participated. 61% of the inspection points (2,252 points) were judged to have "clean water".

3 Preserving and improving coastal environments

Because we must preserve animal habitats, care for scenery, and sustain appropriate usage of beaches, while protecting the coast from storm surges, tsunamis, and high waves, we are proceeding with maintenance and conservation that balances between "defense", "environment", and "usage".

In addition, based on the "Law for Protecting Beautiful and Rich Nature through the Promotion of Disposing Beached Coastal Waste contributing to the Preservation of Coastal Scenery and Conservation of the Environment (Coastal Waste Disposal Promotion Act)", we implement effective measures for beached waste in close cooperation with relevant institution in the future.

Support is being provided for efforts to deal with large-scale debris that drifts ashore and impedes the functions of coastal protection facilities through an emergency project for dealing with large driftwood and other debris items coming ashore in connection with disasters. This project enables concerned parties to process such debris in a concerted, efficient manner.

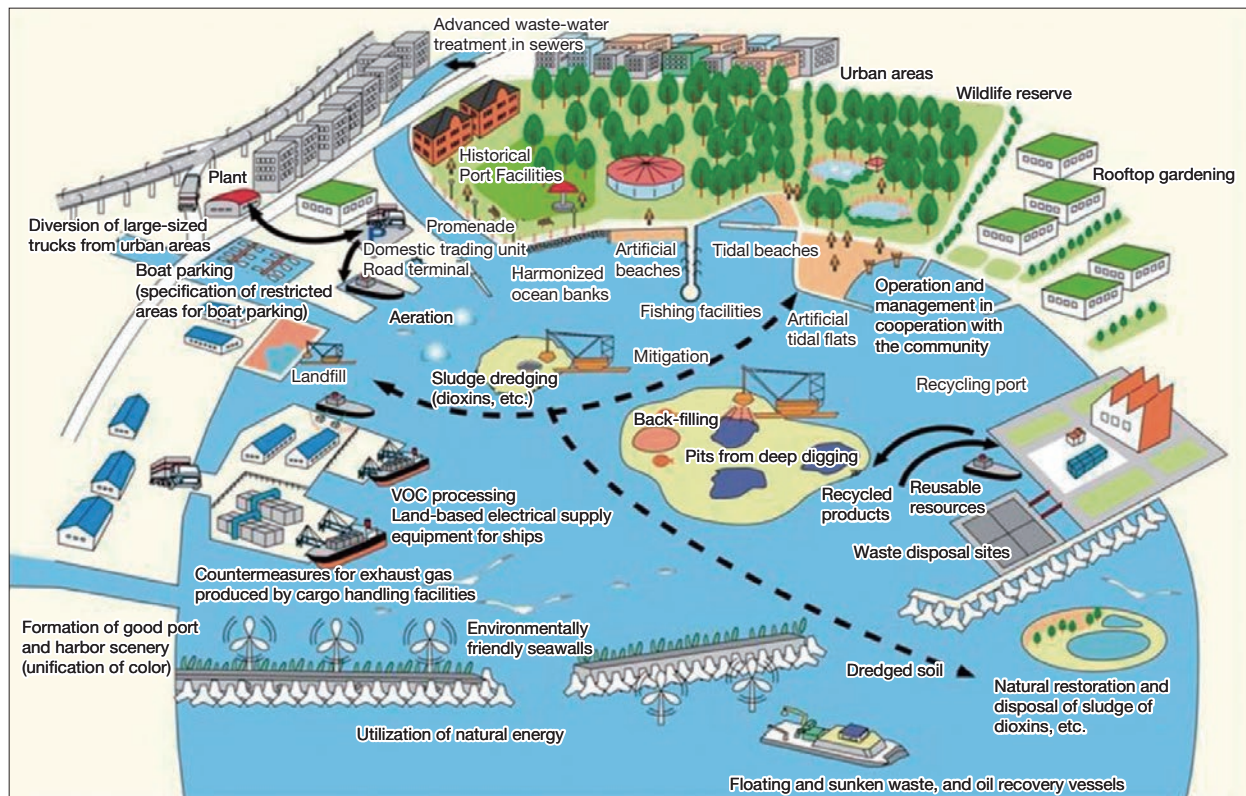
We are also providing support for the processing of neglected and stranded vessels and the removal of slime that abnormally accumulates in sea areas in order to secure the functions of coastal protection facilities, conserve the coastal environment, and facilitate the proper use of coastal areas.

4 Greening port and harbor administration

(1) Basic direction of future port and harbor environment policies

In order for ports and harbors in Japan to uphold their position as grounds for logistics, industry and living, and sustain continual growth, they must recover as much degraded or lost nature as they can, and incorporate environmental conservation in various port functions. For this reason, we are working towards greening port administration, which involves the two parts of port and harbor development and utilization, and conservation, revival, and creation of environments in to one consolidated subject.

Figure II-8-3-2 Greening port administration



Source) MLIT

(2) Actively preserving, reviving, and creating a healthy environment

We strive to efficiently utilize dredged sediment derived from harbor maintenance, by usage in creating tidal flats, sand capping, filling pits from deep digging, and disseminating port facilities that can coexist with organisms. After the projects have been started, we will continuously monitor the status after maintenance by implementing adaptable management methods. Various organizations such as administrative agencies and research institutes will register environmental data and construct a sharable database on the ocean environment; gathering, accumulating and analyzing data. Together, we actively work to preserve, revive and create a rich natural environment in coastal areas.

In addition, the “Seaside Nature School”, which utilizes the areas preserved, revived or created, is being held in various locations throughout Japan as an effort to create opportunities for learning the importance of the natural environment.

(3) Initiatives in measures for preventing illegal boat parking

As there is concern that parked boats may mar the scenery, affect the navigation of other vessels, and cause secondary damage in the event of a tsunami, regulatory measures are being implemented, such as by improving the mooring and storage capacity of small vessels and by designating no-parking zones.

In order to verify the effects of measures as provided for in a promotion plan consisting of comprehensive measures for properly managing pleasure boats and improving their usage environment, as formulated in May 2013, a national survey of actual pleasure boat conditions was conducted in 2014 and the results of this survey were publicly released in June 2015.

5 Greening roads and promoting natural environmental measures

Greening roads is crucial for providing a comfortable atmosphere for those who use them, creating favorable scenery that matches the surrounding scenery, and as a countermeasure against heat island effects. To this end, we are promoting the favorable greening of roads and the appropriate management of this process in accordance with technical standards pertaining to the greening of roads. To prepare for the Tokyo Olympic and Paralympic Games in 2020, we are also endeavoring to green roads and initiatives for comprehensive measures to keep road surface temperature from rising.

Figure II-8-3-3

Example of Greening Roads (Chiyo-da-ku, Tokyo)



Source) MLIT

Section 4 Maintenance or Recovery of a Healthy Water Cycle

1 Aiming to maintain a society in which the blessings of water can be savored for a long time to come

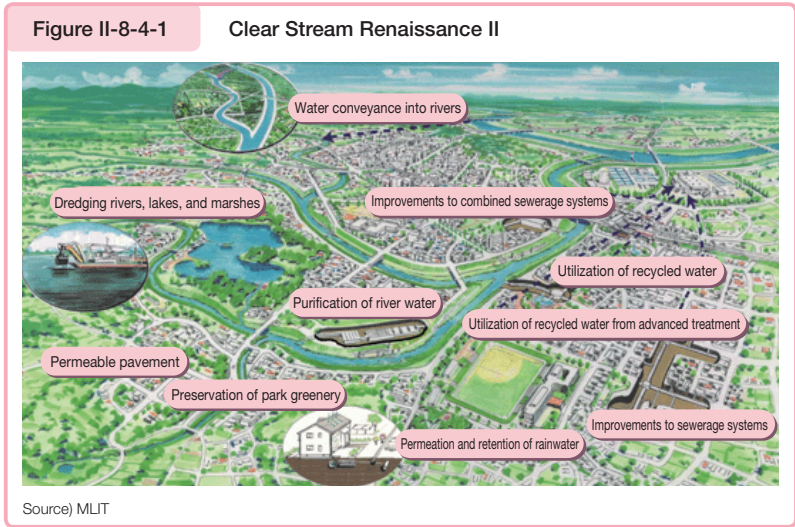
Thus far, the development of water resources development facilities were promoted because of the priority placed on ensuring the balance of water supply and demand in response to the rapid increase in water demand in the post-war high-growth period. On the other hand, there is concern that global warming will usher in reduced amounts of annual precipitation, reduced amounts of snowfall accumulations, the earlier melting of snow, and lower amounts of water that can be supplied. In anticipation of large-scale-disasters, society demands measures to deal with the obsolescence of water-related infrastructure, improvements to the water environment, and the maintenance or recovery of a healthy water cycle. Various challenges that are coming to a head will also need to be addressed, such as in terms of our presence in the area of international contributions and the fortification of our competitiveness in international markets.

Against such a backdrop, it is important that we shift from efforts to promote the development of water resources on a demand-driven basis to efforts to secure a stable supply of water on a risk-management basis in order to advance comprehensive measures for water resources that are shaped by different priorities, including water quality and the natural environment in addition to the quantity of water, even as we adopt a long-term perspective under conditions of constraint that affect resources consisting of people, goods, and money. More specific studies will be conducted to ensure the safety and security of the lives of citizens and of our socio-economic activities and to build a society in which the necessary use of water can be accommodated.

2 Initiatives in improving the water environment

(1) Promoting water purification

The MLIT is implementing purification of contaminated water in rivers with seriously deteriorated water environments and water purification of dredged bottom mud. In addition, the local municipalities that are proactively working on the water environment improvement and related institutions, such as river administrators and sewage work administrators are working together to formulate the “Second Water Environment Improvement Urgent Action Plan (Clear Stream Renaissance II)” and implementing the plan (formulated in 32 locations).



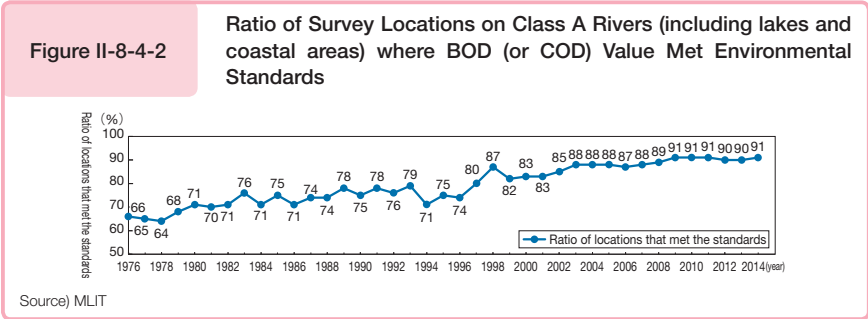
(2) Water Quality Survey and Water Quality Accident Response

Water quality surveys are vital in conserving and maintaining a favorable water environment. In 2014, surveys were done at 1,080 locations on 109 water systems of Class A rivers.

MLIT is creating of water quality survey maps and conducting surveys of aquatic organisms in cooperation with citizens. As a result of surveys—which were based on the new water quality index with a multi-faceted evaluation of the river such as amount of garbage and odors—being conducted on Class A rivers in cooperation with the local residents, in 2014 approximately 22% (65 locations/ 301 locations) were judged to be “rivers that look clean enough for swimming.”

On the other hand, in 2014 there were 1,238 water quality accidents in Class A rivers due to spillage of oils and chemical substances. In terms of water pollution prevention, Water Pollution Prevention Liaison Councils composed of river administrators and related institutions have been put in place for all 109 waterways, and they are working on prompt information communication for incidents of water quality accidents as well as damage prevention by building oil fences.

- For Class A Rivers (including lakes and coastal areas), the proportion of survey sites that met the environmental standards for BOD (biochemical oxygen demand) or COD (chemical oxygen demand) value was 91% in 2014.
- For environmental standard items relating to the protection of human health (27 items such as arsenic), the proportion of survey sites that met the environmental standards was approximately 99%, with most sites meeting the standards.



(3) Improving the water environment of enclosed coastal seas

Regarding the enclosed coastal seas of the Tokyo Bay, Ise Bay, Osaka Bay, and the Seto Inland Sea, because of the polluting load draining from land and deterioration of purification capacity in ocean areas due to the loss of tidal flats and seaweed forests, the fishing industry has suffered damages from the occurrence of red and blue tides. In addition to this,

there have been occurrences of environmental deterioration, as well as navigational obstacles to vessels, due to drifting debris and oil.

To resolve the current state, we advance activities to revive beautiful oceans by (1) sediment dredging, sand capping, and back-filling pits from mining to improve the substratum, (2) creating habitats for organisms by reviving tidal flats and seaweed forests and disseminating buildings that can coexist with nature, (3) removing floating waste and oils by using sea environment maintenance ships, (4) reducing the amount of pollutants released into the ocean by improving sewage treatment facilities, and (5) developing a system to get various entities to improve the environment in collaboration with one another.

(4) Stimulating sewage maintenance to improve the water environment

We will appropriately formulate and review the comprehensive basin-wide planning of sewage systems, and promote high temperature incineration to remove nitrogen and phosphates which contribute to the eutrophication of enclosed bodies of water. In addition, we are working for early advancement in improving water quality and stratified advanced water treatment by partially renovating equipment and facilities in treatment plants that have not yet reached their scheduled renewal period.

As for the combined sewerage system, we plan to complete implementation of measures by the end of FY 2023 through controlling the amount of water and the frequency at which untreated water is released in to streams during heavy rains.

3 Cultivating water and using it efficiently

(1) Stable supply of water resources

In order to secure stability in the utilization of water, there must be various policies corresponding to the situation of communities from both standpoints of supply and demand. Specifically, in the facet of demand, there are measures to strengthen the recovery and reuse of water, and increase awareness for conserving water. In supply, there are measures to build and maintain facilities to supply water which are water resource development facilities such as dams, implement countermeasures for aging facilities, and develop crisis management measures, etc. In addition to the sustainable conservation and use of groundwater, and promotion of utilizing rainwater and recycled water, based on the “Special Measures for Water Source Area Act”, work is being done to develop the living environment of the water source area and the industrial infrastructures, along with prevention of water pollution of the dam reservoirs.

There is concern that climate change caused by global warming will lead to more frequent, severe droughts that last longer and give rise to more drought-related damage. For this reason, the MLIT will promote measures to prevent/mitigate the damage caused by drought, such as strategies to minimize damage at the time of critical droughts.

(2) Efficient use of water resources

a. Initiatives towards expanding the utilization of recycled water derived from sewage

Stable amounts of recycled water can be secured and is a valuable water resource in urban areas. Of all the treated sewage, approximately 1.5% undergoes treatment according to purpose, and recycled water is used in streams, sustaining water levels of rivers and the sanitation of toilets. We aim to further expand the utilization of recycled water.

b. Promoting the utilization of rain water

In order to efficiently utilize water resources, initiatives are being promoted to treat and use rainwater and wastewater from facilities for sanitation of toilets and sprinklers. There are approximately 2,000 facilities utilizing treated water as of the end of FY 2014, and they use over 8.1 million m³ a year. The “Law for Promoting the Use of Rainwater (2014 Laws, Issue 17)” was enacted on May 1, 2014, and in March 2015 the “Basic Policy for the Promotion of Rainwater Use” and the “Goal for Establishing a Facility for the Use of One’s Own Rainwater in Cases Where the Building is Equipped by the National Government or an Independent Administrative Agency” were established in order to promote the use of rainwater and thereby facilitate the effective use of water resources. Additionally, the government will formulate and enact comprehensive measures for the purpose of contributing to the containment of concentrated drain of rainwater to the sewers and waterways.

(3) Securing safe, quality water

With the spread of the waterworks systems, the demand from citizens for safe, delicious water has increased in recent years, making even greater efforts that emphasize water quality vital.

(4) Promoting measures concerning the permeation of rainwater

Due to the spread of impervious areas in recent years by urban development of drainage basins, more rainwater flows into rivers in short periods of time instead of being absorbed into the ground. In addition to reducing flood damage from heavy rains by absorbing as much rainwater as possible into the ground, improvement to rainwater storage penetration facilities are being promoted through tax measures, for cultivating groundwater, contributing to the revival of springs, and building a healthy water cycle system.

(5) Advancing the conservation and use of sustainable groundwater

It takes an extremely long time to recover from damage caused to groundwater, such as in the form of groundwater pollution or saline contamination. In particular, ground subsidence is an irreversible phenomenon. For this reason, we will engage in groundwater management in accordance with local conditions in order to prevent groundwater damage, conserve the ecosystem, protect local groundwater sources, and advance the conservation and use of sustainable groundwater to be used as a water resource.

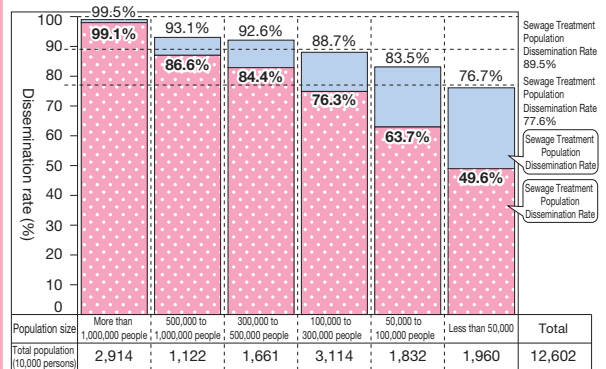
4 Realizing amenity by promoting improvements to sanitary drainage

Sewage is the indispensable social infrastructure for the development of healthy cities, treating waste, and preventing floods. In recent years, sewage systems have been asked to take on new roles in helping to form a low-carbon, recycling-oriented society and in maintaining or restoring a healthy water cycle.

(1) Dissemination of sewage processing with sanitary drainage

Although the dissemination of sewage treatment plants reached around 89% (with the dissemination of sewage systems at around 78%) of Japan as of the end of FY 2014 (total of 46 prefectures, excluding Fukushima due to the effects from the Great Eastern Japan Earthquake), there is a large gap between regions. In particular, the dissemination rate of sewage treatment plants in small to medium communities with populations of less than 50,000 people remain low, only reaching a ratio of approximately 77% (dissemination rate of sewage systems approximately 50%). Focusing on improvement in areas with high population density, the advancement of efficient development in accordance to condition of communities and the rectification of the gap between communities are seen as being of the utmost importance for developing sewage systems in the future.

Figure II-8-4-3 Sewage Treatment Population Dissemination Rate by Size of City (FY2014 year-end)

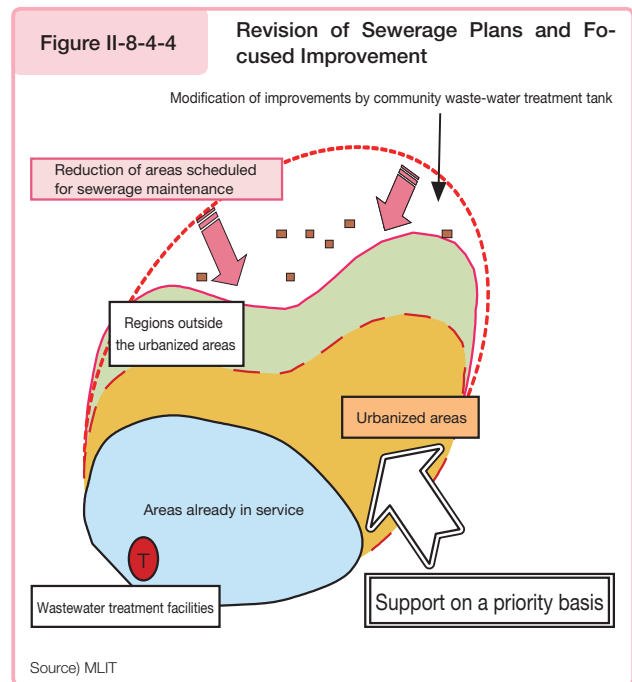


(Note) Due to the Great Eastern Japan Earthquake, the Fukushima prefecture was excluded from the survey.

Source) Prepared by the MLIT from information materials provided by the Ministry of Environment and Ministry of Agriculture, Forestry and Fisheries

a. Initiatives towards the septic system overview in roughly 10 years

In regards to the maintenance of sewage treatment facilities, individual disposal by using septic tanks are economical in areas where households are widely distributed throughout a region, while the collective disposal with sewerage systems and drainage facilities for agricultural communities become more economical as the population density rises. For this reason, each prefecture has established a “Prefectural Plan”, a compiled maintenance plan over sewerage treatment which reflects considerations over regional characteristics such as the economic efficiency and importance of protecting water quality. Currently, in light of the population decline of recent years, MLIT is promoting an immediate re-examination of prefectural schemes and the creation of mid-term (action plan)/long-term equipping plans, in order to work towards a septic system overview in roughly 10 years. In addition, efficient means of maintenance are also being actively promoted through the implementation of cooperative schemes between other waste water treatment facilities such as cross-jurisdictional wastewater treatment.



b. Sewage quick project

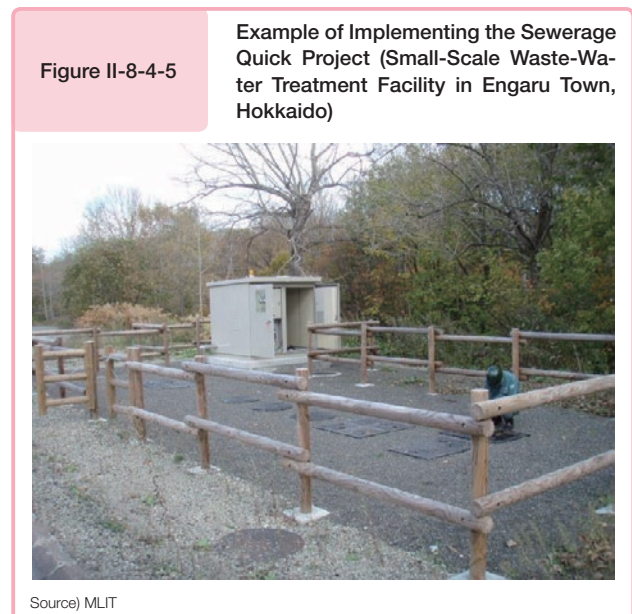
Taking into account the population decline and the difficult fiscal situation, this project seeks to widely introduce—with the cooperation of the district citizens and verification of the performance by a committee of experts—maintenance methods that are not stuck in technological standards of the past, that meets the current conditions of the district, and that are low-cost, while making early and flexible maintenance possible. By FY 2014, a social experiment was conducted in 14 municipalities, and 6 technologies—such as the “Small-Scale Waste-Water Treatment Facility (contact oxidation method)” —were determined to be effective, leading to a user’s guide being put together for the use of these technologies. The verification/evaluation of the other technologies is in progress to make nationwide usage possible.

(2) Attaining durability in sewerage projects

a. Proper stock management

Sewage systems possess enormous amounts of stock consisting of approximately 460,000 kilometers of pipes and conduits and approximately 2,200 terminal treatment stations (as of the end of FY 2014).

As these systems were rapidly developed during and after the period of high economic growth, aging facilities are expected to rapidly increase in number in the future. Although in FY 2014, mainly small scale issues were arising, road collapses have occurred in 3,300 places due to corrosion caused by hydrogen sulfide and aging of the conduit facilities. Because the sewage system is an important social infrastructure which supports the safe and secure social and economic activities of urban living and provides a lifeline that is difficult to replace with alternative means, there is a necessity to sustain the required functions by conducting efficient, planned measures to deal with aging facilities through the introduction of stock management that practices preventative maintenance, while at the same time considering the



introduction of comprehensive private consignment and efficient pipe inspection methods.

In May 2015, the Sewerage Act was amended and standards for maintaining and repairing sewage systems were established. In response, it was decided that drainage facilities at significant risk of corrosion would be inspected at an appropriate frequency of at least once every five years and initiatives to ensure sustainable sewage functions are being undertaken. Under these amendments, a council meeting program for engaging in necessary discussions on widening the geographic scope of sewage works and forming partnerships among the administrators of sewage works shall be established and the provision of support to local governments will otherwise be reinforced to ensure the durability of sewerage projects.

b. Reinforcement of business infrastructure

In the operation of sewerage projects, although it is a fundamental rule to cover costs (excluding portions covered by public expense) for treating waste water with money acquired from usage fees, the initial establishment requires a lump sum of funds. Due to the business characteristic in which income begins to stabilize as sewerage systems develop, there are cases where funds fall short during construction. Accordingly, prospects for income and expenditures tied to individual projects will need to be examined not on a short-term basis but rather on a long-term basis by taking the length of the service life of the given facilities into account. Therefore, with the “Guide for restoring financial health in sewerage management” we are pushing initiatives in each municipality for the restoration of financial health in sewerage business management.

c. Consigning facility management to private sectors and acquiring technical capabilities

Deliberations for the introduction of public facilities governance method for sewerage projects, and efforts for making further use of private sector consignment ^{Note 1} for the maintenance management of sewage treatment plants, are both moving forward. Based on demands from local public organizations, the Japan Sewerage Works Agency provides technical support for constructing sewage facilities, as well as for optimizing their operation and maintenance, and cultivating technical experts at local public organizations, while developing new technology.

(3) Revitalizing communities through sewage

The proper treatment of wastewater through improvements in sewage, and the preservation or creation of healthy water environments, stimulates promotion of tourism and industry. In addition, by creating river fronts using recycled water from advanced wastewater treatment, stimulating regional activities through the operation and management of water amenity spaces by citizens, utilizing space above wastewater treatment facilities, transferring sewage heat to be used as district heating, utilizing bio-gas as energy and efficiently using sewage resources, sewage contributes to regional vitalization in numerous facets.

(4) Promoting environmental education in the field of sewage

Working groups, consisting of elementary school teachers and sewage administrator representatives, created teacher edition textbooks that were well suited for classroom use for sewage education. In order for teachers to freely make use of these teaching materials regarding sewers, they are being offered through the “Sewer Systems, the Path of Circulation Environmental Education Portal Site” ^{Note 2}. Additionally, subsidies

Figure II-8-4-6 Environmental Education regarding the Sewerage Sector

Project for Sewerage Environmental Education for Elementary Schools in Hamamatsu City, Shizuoka



Source) MLIT

Note 1 A method of facility management that reflects original ideas of private contractors by consigning details of operation methods in order to optimize operation while charging the responsibility to secure a specified level of capabilities such as sustaining the quality of released water to optimize operation.

Note 2 “The Path of Recycling Sewerage Environmental Education Portal Site”
<http://www.jswa.jp/kankyo-kyoiku/index.html>

are granted to each elementary and middle school for supporting environmental education on sewage.

Section 5 Protecting the marine environment

(1) Control policies over large scale oil pollution

In order to eliminate the substandard vessels (a major factor for large scale oil pollution), Japan actively participates in international initiatives, such as the formulation of the international shipping database (EQUASIS), while also strengthening Port State Control (PSC), which checks if vessels meet standards, by conducting on-site inspection of vessels that enter Japanese ports. While the flag states government have the duty to implement and enforce regulations and standards developed at the International Maritime Organization (IMO), in order to assess the flag states governments' performance of their duties, IMO assembly meeting established the Voluntary IMO Member State Audit Scheme in 2005, based on the Japan's proposal. In 2016 the scheme became mandatory, on the bases of evaluation of the progress in addressing the scheme globally.

In other fronts, as countermeasures for occurrences of large scale oil pollution in the Sea of Japan, Japan is working on strengthening international cooperation and collaborative systems by drawing up plans such as the "NOWPAP Regional Oil and HNS Spill Contingency Plan" through the "Northwest Pacific Action Plan (NOWPAP)", the framework for joined efforts between Japan, China, Korea and Russia for protecting the marine environment. As for large-scale oil spillages that occur in domestic waters, measures have been established for prompt and precise response through the utilization of large-sized trailing suction hopper dredgers.

The MARPOL Convention ^{Note 1} imposes controls on the discharge of oil and garbage by vessels. In Japan, taxation and other forms of support for the development of facilities to receive waste oil generated inside vessels are being provided and the (draft) "Guidelines for Reception Facilities of Ship-generated Garbage in Ports and Harbors" have been formulated to ensure that oil and garbage are appropriately received in ports and harbors.

(2) Control measures on air pollution from ships

Since sulfur oxide (SO_x) can negatively affect the human body and cause acid rain, the International Maritime Organization (IMO) regulates SO_x emitted by vessels according to the MARPOL Convention, which stipulates standard values of sulfur concentrations in fuel oil used by vessels according to the sea area in which vessels operate. Presently, the MARPOL Convention stipulates a maximum concentration of 0.1 percent in certain sea areas subject to strict controls (emission control areas) and a maximum concentration of 3.5 percent in all other seas areas (general sea areas). With respect to general sea areas, the MARPOL Convention provides for the lowering of the current standard value to a maximum of 0.5 percent from as early as January 1, 2020. (The IMO will determine the availability of compliant fuel oil. If it is determined that compliance with regulations on January 1, 2020 by vessels is impossible, the date from which this change will take effect shall be January 1, 2025.)

In addition to participating in IMO discussions pertaining to SO_x emission reductions, Japan has engaged in other initiatives with a view to disseminating natural gas-fueled ships that can significantly reduce the amount of SO_x emission, such as by formulating safety standards and codifying them into international rules and providing construction support. Domestically, Japan's first natural gas-fueled ship went into service in September 2015.

(3) Responding to issues of invasive aquatic species carried by ships

Control measures on invasive aquatic species carried by ships It is pointed out that the transfer of aquatic species via ships' ballast water ^{Note 2} and ships' biofouling would threaten marine ecosystem in waters where these ships navigate in. In order to prevent the transfer of invasive species, "International Convention for the Control and Management of Ships' Ballast Water and Sediments in 2004" and "the 2011 Guidelines for the Control and Management of Ships' biofouling to minimize the transfer of invasive aquatic species in 2011" were adopted at the IMO. With the necessity to take action to prevent the disruption to the ecosystem caused by the harmful ballast water from international shipping and to fulfill the international responsibility under the international cooperation, the Government of Japan proposed the law to implement the Ballast Water Management Convention (amendments Act on Prevention of Maritime Pollution and Maritime Disaster)

Note 1 International Convention for the Prevention of Pollution from Ships.

Note 2 Sea water loaded as weight to balance the ship when it carries no cargo.

to the 186th ordinary session of the Diet, and it passed with an unanimous vote. ^{Note} Japan concluded the convention in October 2014 and has made efforts to develop on environmental development work to enable the early entry into force of the convention.

Section 6 Improving living environments by preventing atmospheric and noise pollution

1 Policies for environmental issues related to road traffic

(1) Measures for individual vehicles

(i) Exhaust gas reduction measures

Statutory amendments were passed in July 2015 with respect to exhaust gas measures applicable to new vehicles in order to further reduce exhaust gas generated by trucks, buses, and motorcycles. Concerning trucks and buses, we consequently introduced the Worldwide Heavy-Duty Certification procedure (WHDC), reinforced regulatory values applicable to nitrogen oxides, introduced exhaust regulations for off-cycle emissions, and mandated that vehicles be equipped with advanced on-board diagnostic systems. Concerning motorcycles, we reinforced regulatory values applicable to exhaust gas, introduced fuel evaporative gas measures, and mandated that vehicles be equipped with on-board diagnostic systems. We have been successively applying these changes since October 2016. In order to introduce the Worldwide Harmonized Light vehicles Test Procedure (WLTP) for testing exhaust gas and fuel efficiency with respect to passenger vehicles, we are preparing revisions to concerned laws and ordinances and will begin applying these procedures progressively in 2018.

In connection with Volkswagen emissions scandal that emerged in September 2015, relevant statutes and ordinances were amended in November of the same year and the use of software to activate emission control devices on passenger cars only during testing and to turn deactivate them when the vehicle is operating under real-world conditions was banned. Review meetings chaired by experts were held jointly with the Ministry of the Environment to study reviews of emissions test procedure for passenger vehicles.

In order to help consumers identify and select vehicles that perform exceptionally well in terms of reducing the amount of exhaust gas generated, a program for certifying low-exhaust gas vehicles according to the given level of reduction has been implemented for vehicles that reduce harmful substances by more than the regulatory values for exhaust gas that apply to them.

Exhaust gas measures for in-use vehicles (vehicles already in usage) such as those based on the Amendment Act on Reduction of Total Amount of Nitrogen Dioxide and Particulate Matters Originating from Automobiles in Designated Areas (Automobile NOx PM Law) are being implemented.

(ii) Reinforcing noise regulations

With respect to measures to deal with noise pollution generated by vehicles, regulations govern noise generated from accelerating the vehicle, steady running noise, and proximate exhaust noise. In order to introduce noise regulations tied to tires as a measure to reduce the noise generated by tires on four-wheeled vehicles that contribute considerably to the noise generated by normal operations, statutes and ordinances were amended in October 2015; these provisions will begin to be progressively applied in April 2018.

In order to harmonize noise regulations governing four-wheeled vehicles with international standards that will reinforce regulations in two stages, statutes and ordinances were amended in April 2016; these provisions will begin to be progressively applied in October of the same year.

Note Also, a proposal to obtain the approval for conclusion of the Convention was submitted to the 186th ordinary session of the Diet, and the proposal passed with unanimous vote.

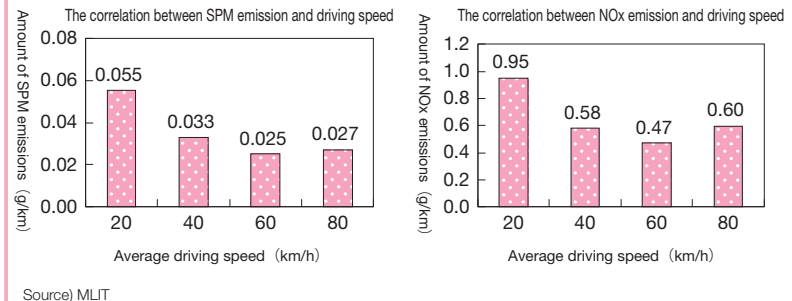
(2) Promotion of traffic flow Measures

(i) Countermeasures for Air Pollution

The volume of particulate matter (PM) and nitrogen oxide (NOx) emissions from automobiles is increasing because of the increasing frequency of stop-and-go traffic and the reduced travel speed. For this reason, we are advancing the shift through traffic in urban areas to bypasses as a way to improve the roadside environment.

Figure II-8-6-1

The Correlation Between Driving Speed and the Emission of Particulate Matter and Nitrogen Oxides (NOx) from Vehicles



(ii) Countermeasures for noise pollution

Japan is proceeding with the lamination of low-noise pavement, installation of noise barriers, and maintenance of environmental roadside facilities. Based on the “Law for the Improvement of Areas along Trunk Roads”, in addition to preventative measures for issues caused by traffic noise, financial assistance is being provided for buffer buildings and noise insulation work for housing in construction projects in areas alongside roads.

2 Environmental measures for airports and surrounding areas

In Japan, we have been steadily implementing various measures to deal with aircraft noise through improvements in materials made possible by the introduction of low-noise aircraft, restrictions on departures and arrivals imposed via regulations governing night-time flights, improvements in flight methods based on noise-abatement operations, upgraded airport structures, and measures concerning the peripheral environment, including sound-insulation work and the provision of compensation for relocation. In recent years, the growing popularity of low-noise aircraft accounts for a reduced impact that aircraft noise is having on areas surrounding airports even as the number of departures and arrivals by aircraft is rising.

We will need to strive to accommodate the growth of areas surrounding airports and the desire to conserve the local environment by continuing to take comprehensive measures to deal with aircraft noise while gaining the understanding and cooperation of local residents in accordance with changes in such conditions as the demand for air travel.

3 Countermeasures for Railway Noise

In terms of the noise control for Shinkansen bullet trains, countermeasures for noise are being taken, such as the installation of sound barriers, the raising of track level, etc. For the construction of new railways for Shinkansen bullet trains, for regions where the measures mentioned are difficult to implement, Japan is providing financial aid for sound insulation work in already existence housing.

As for noise control measures for existing lines, each railway company is instructed to lower noise levels below a fixed value when constructing new railways and renovating already existing railways, more than previously in large-scale improvement projects, based on the “Guidelines for Noise Abatement Measures in the Construction of New Lines and Large-scale Improvement of Conventional Railways.”

4 Countermeasures for urban heat islands

Heat island effect refers to the phenomenon where a metropolitan area is significantly warmer than its surrounding rural areas. The global annual mean temperature has risen at a rate of around 0.7°C per century. At the same time, annual mean temperature averaged for locations in Japan that are likely to be only minimally affected by urbanization is expected to rise at a rate of about 1.5°C per century. In contrast, annual mean temperatures in major metropolitan areas will rise by

approximately 2-3°C, such that urbanization will likely aggravate the global warming trend and render temperature increases more prominent.

In order to advance comprehensive and effective measures for dealing with the urban heat island effect, we are engaged in various initiatives according to the Outline of Measures for Dealing with the Heat Island Effect, which systematically summarizes specific measures put forth by relevant ministries and agencies. These initiatives include the following : initiatives that reduce artificial heat emitted by air-conditioning systems and automobiles, initiatives that improve ground surfaces based on the greening of public spaces and the use of water, initiatives that consist of urban development projects that take wind channels into account, and initiatives for which observations, monitoring, and surveys are conducted with respect to the heat island phenomenon.

5 Countermeasures for sick building syndrome and soil contamination

(1) Countermeasures for sick building syndrome

Sick building syndrome describes a situation where materials used in the interior of a building disperses chemical substances which are hazardous to health. Japan is taking measures such as regulations on building materials and ventilation in the “Building Standard Act”, and formulating performance labelling systems based on the “Housing Quality Assurance Act.”

In the maintenance of government facilities, Japan has implemented restrictions over the usage of building materials containing chemical substances, as well as measuring the indoor concentration of airborne chemical contaminants after completing construction.

(2) Countermeasures against issues related to dioxins

Studies over the water and earth quality of class A river systems throughout Japan are being conducted for dioxins specified in the “Act on Special Measures concerning Countermeasures against Dioxins.” In FY 2014, the sediment of all locations and the water quality of 98% (219 locations out of 224) of the locations satisfied environmental standards.

For rivers, ports, and harbors, we have implemented dioxin countermeasures as required according to the Manual on Measures to Deal with Dioxins at the Bottom of Lakes (proposed), which was revised in April 2008, and the Technical Guide on Measures to Deal with Dioxins at the Bottom of Ports and Harbors (revised edition). Support for programs involving pollution-prevention measures is being provided for rivers, ports, and harbors where dioxins exceeding standards have been detected in samples taken from the bottom of these locations.

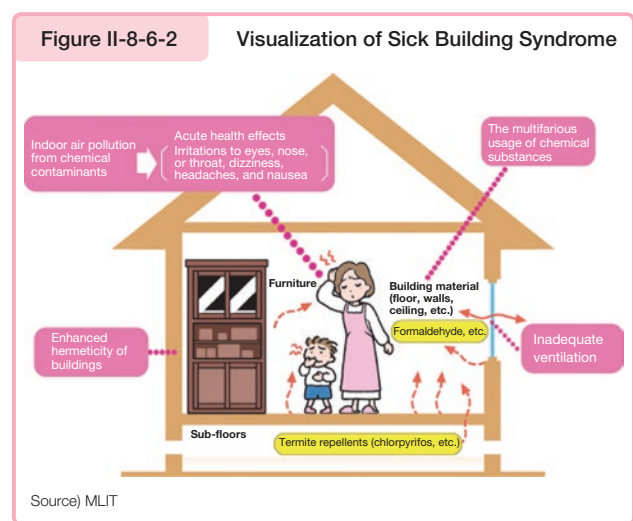
(3) Measures against asbestos

Issues concerning asbestos are life-threatening. As buildings that were built in the 1970s—when mass amounts of asbestos was imported to Japan—each their dismantling period, it is important to implement pre-emptive measures to prevent injuries from occurring.

In order to accurately and efficiently determine the actual use of asbestos building materials, investigators are being trained based on the system for investigators of structures containing asbestos building materials, which was created in 2013.

Also, based on the “Building Standards Law”, the removal of sprayed asbestos when renovating a building is required, auxiliary system of comprehensive grants for social capital development is in place to promote the asbestos removal in existing buildings and follow ups are being done for the situation of the removal and anti-scattering of asbestos in the existing facilities under the jurisdiction of national ministries and agencies.

Furthermore, Japan is promoting the dissemination of information in efforts such as compiling data bases on referential cost estimates for removal work of spray-applied asbestos insulation, documents useful for identifying building materials



containing asbestos (Visually identifiable building materials containing asbestos) and information on such materials, as well as pamphlets for measures related to asbestos in buildings.

6 Environmental measures in construction

The gas emissions measures (NO_x, PM) for construction machinery that are not driven on public roads, the registration, certification and approval are being handled based on the “Act on Regulation, Etc. of Emissions from Non-road Special Motor Vehicles”. Things like the low interest loan system is in place to provide assistance for the purchasing of construction machinery that have been adapted to be environment-friendly by meeting the latest emission standards and having reduced noise.

Section 7 Observing, Monitoring, and Forecasting Changes in the Global Environment

1 Observing and monitoring the global environment

(1) Observing and monitoring climate change

In order to grasp the status of greenhouse gases (GHGs), the Japan Meteorological Agency (JMA) is observing CO₂ trends in the atmosphere at three stations in Japan. CO₂ concentrations in the marine atmosphere, as well as those in the sea surface water are being observed in the western North Pacific by research vessels. GHGs in the upper troposphere in the western North Pacific is also being observed. Furthermore, JMA is not only monitoring climate changes, but also observing solar and infrared radiation at domestic five stations in order to reduce an uncertainty of global warming projections.

In addition, JMA observes sea level rise accompanied by global warming, and publish information on the long-term change in sea levels around Japanese coasts.

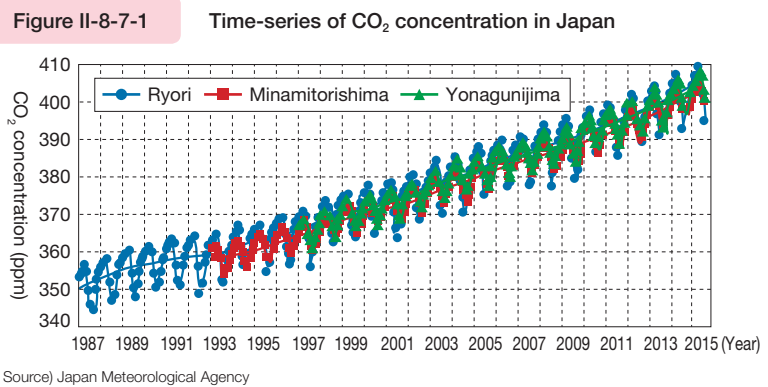
In addition, in order to improve the accuracy of seasonal weather forecasting and monitoring of climate change, JMA produced the Japanese 55-year reanalysis (JRA-55), a historical global atmospheric data with homogeneity in space and time.

Moreover, “Climate Change Monitoring Reports” and “Report on Climate Change and Extreme Weather” (in Japanese) are compiled based on results from observation, and future projection of climate changes, extreme weather events and global warming is disclosed to the public. Serving as the World Data Centre for Greenhouse Gases (WDCGG) of the World Meteorological Organization (WMO), JMA also archives and provides observation data on greenhouse gases around the world.

(2) Observing and monitoring extreme weather events

The Japan Meteorological Agency (JMA) monitors unusual weather events occurring in Japan and elsewhere in the world and summarizes and releases periodic and extraordinary information concerning weather disasters and areas where extreme high and low temperatures, heavy and light rainfalls, and other such events have been observed. Also, when extreme weather conditions are occurring that significantly affect the public, summary reports are given covering the information regarding features, factors and the outlook.

Furthermore, as a Regional Climate Center of the World Meteorological Organization (WMO), JMA provides information such as monitoring and analysis of extreme weather as well as technical assistance through training and dispatch of experts to National Meteorological and Hydrological Services in Asian countries to support the climate service in the Asia Pacific region.



(3) Observing and monitoring with geostationary meteorological satellites

The Japan Meteorological Agency launched Himawari-8, a new geostationary meteorological satellite, into space on October 7, 2014; this satellite began operating on July 7, 2015. There is also a plan to launch Himawari-9 in FY 2016. By using these satellites-in addition to improving the disaster prevention function against such things like tropical cyclones and torrential rainfalls-Japan is leading the world in strengthening its monitoring function of the Earth's environment, including global warming.

(4) Observing and monitoring the ocean

The ocean is greatly impacting the earth's climate by storing a much larger amount of heat than the atmosphere, and it is also easing the progression of global warming by absorbing CO₂ discharged by human economic activity. In order to monitor global warming, an accurate grasp of oceanic conditions is essential.

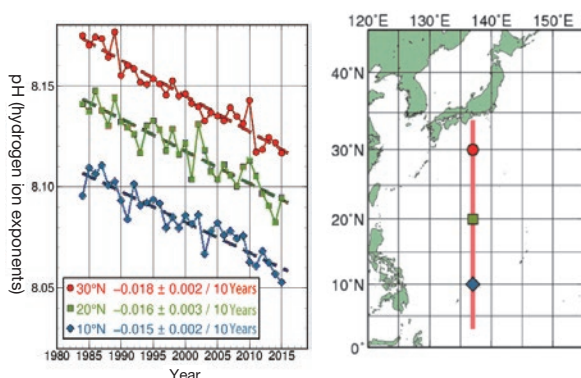
The Japan Meteorological Agency (JMA), under the international cooperative structure, monitors oceanic conditions by carrying out ocean observation with high accuracy from research vessels in the western North Pacific along with using data from satellites and Argo floats, or profiling floats to automatically observe the ocean interior.

JMA website "Marine Diagnosis Report" provides information on the present status of the ocean such as ocean temperatures, ocean currents, sea level, sea ice, as well as the prospect for the future.

The Japan Coast Guard constantly monitors fluctuations in the Kuroshio Current in waters surrounding the Izu Islands, using high-frequency radar, and publishes the observation data. In addition, the Japan Oceanographic Data Center collects and manages data obtained by Japanese marine research organizations, and discloses it to relevant institutions and to the public.

Figure II-8-7-2

Monitoring the Global Environment using research vessels

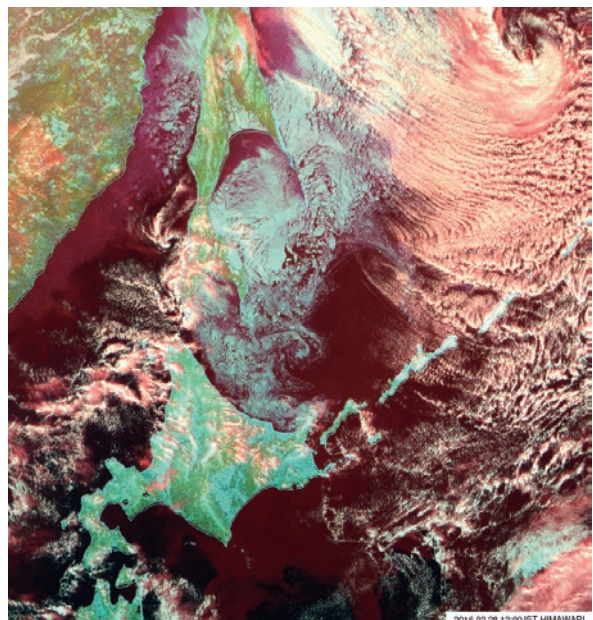


The long-term changes in hydrogen ion exponents (pH) at latitudes 10, 20, 30 degrees north along 137 degrees east meridian (left) and the area map for data analysis (right). The numbers in the graph indicate the decreasing rates per 10 years. The lesser pH indicates the more progress of "ocean acidification".

Source) Japan Meteorological Agency

Figure II-8-7-3

Example of a "Marine Diagnosis Report" published on the Japan Meteorological Agency Website



[Satellite imagery of the southern part of the Sea of Okhotsk (Himawari, a geostationary meteorological satellite)]

A satellite image of the southern part of the Sea of Okhotsk as observed by Himawari-8, a geostationary meteorological satellite.

By using and processing multiple channels of images taken by satellites, sea ice is shown in blue, oceans are shown in black, and cloud is shown as ranging from white to red. (Satellite imagery on February 28, 2016)

Shown in light blue, sea ice is revealed to be distributed across an area from the east coast of Sakhalin to the Hokkaido coast facing the Sea of Okhotsk.

Source) Japan Meteorological Agency

(5) Observing and monitoring the ozone layer

The Japan Meteorological Agency annually publishes the outcome of observations on ozone and ultraviolet radiation. According to these studies, the global amount of ozone continues to be low from a long-term perspective. Additionally, in order to prevent adverse effects to the human body by ultraviolet radiation, information on the topic is published daily using a numerical index (UV index) for easy comprehension of the intensity of ultraviolet radiation.

(6) Promoting routine operational observation in the Antarctic

The Geospatial Information Authority of Japan facilitates activities carried out by Antarctic research expeditions. At the same time, it makes geodetic observations, produces and updates topographical maps, and develops satellite image maps on the Antarctic region in order to contribute to international activities relating to research on global environmental changes and geodetic surveys.

The Japan Meteorological Agency continues to conduct observation of ozone, solar and infrared radiation, surface and upper-air at the Syowa Station (Antarctica). Accumulated meteorological data contribute to monitor and research the global environment, such as the changes in Antarctic ozone hole and global climate, and are utilized for the formulation of international policies.

The Japan Coast Guard is conducting topographical studies on the sea floor. The observation data is being used for compiling nautical charts and as the basis for research related to past environmental conditions such as glacial erosion and sedimentary environments. In addition, they conduct tidal observations and monitor the fluctuations in sea levels, which are closely tied to global warming.

2 Research and Prediction of the Global Environment

The Japan Meteorological Agency and the Meteorological Research Institute are developing prognostic models on changes in climate around Japan and the world, and actively participate in international research programs such as the World Climate Research Programme (WCRP). Earth system models that track the carbon cycle process and other changes and higher resolution regional climate models are being developed, and research for making warming predictions is being conducted. Proactive contributions were made to the release (in FY 2012) of “Global Warming Projection Vol.8” which shows the detailed warming predictions for the area around Japan based on a highly developed regional climate model, the fifth assessment report of the Intergovernmental Panel on Climate Change (IPCC) (released in 2013-2014), and the plan for adapting to the impact of climate change (Cabinet decision of November 2015).

The National Institute for Land and Infrastructure Management released the results of research into climate change adaptation conducted from the standpoints of flood control, water utilization, and the environment through the Interim Report on Research into Climate Change Adaptation (2013) and other documents. These results have been incorporated into various materials, including Adapting to Climate Change in the Area of Water Disasters (August 2015), a report issued by the Social Development Council, and a plan for adapting to climate change (November 2015) as formulated by the MLIT.

3 Promoting Global Mapping Project and the world geodetic network

The Geospatial Information Authority of Japan is in charge of the secretariat of the Global Mapping Project (in which 183 countries and regions are participating as of January 2016), continuously leading the project which develops and releases digital geospatial information on land areas around the globe. The activities using geospatial information toward to disaster risk reduction and the effort to understand and analyze the global environment are promoted. In addition, Japan contributes to global scale observations and researches through the activities, e.g., international VLBI (Very Long Baseline Interferometry is a space geodetic technique using radio waves from quasars) and SLR (Satellite Laser Ranging is a method for measuring the range between an artificial satellite with retroreflectors and a ground station by laser pulse), tide observations, absolute gravity measurements, and participation in International GNSS Service (IGS).

Chapter 9

Strengthening Strategic International Expansion and Contributions

Section 1 Promoting the Export of Infrastructure Systems

1 General Direction of Government Policy

The government established the “Infrastructure Strategy Economic Cooperation Meeting” in March 2013 and compiled the “Infrastructure System Export Strategy” based on deliberations carried out by relevant ministers, including the Minister of Land, Infrastructure, Transport and Tourism, regarding government policies in May of the same year. A revised version of this strategy was formulated in June 2015 with the aim of helping Japanese companies secure orders for infrastructure systems totaling approximately JPY 30 trillion in 2020 (approximately JPY 10 trillion in 2010). The active implementation of the 2015 revision of the “Japan Revitalization Strategy” was also approved by Cabinet in the same month.

In May 2015, a high-quality infrastructure partnership incorporating the provision of approximately 110 billion dollars of high-quality infrastructure investments in the Asian region over the next five years was announced by Prime Minister Abe. Through this partnership, the government aims to further mobilize private-sector funds and expertise to realize infrastructure investments that are sufficient in terms of both quality and quantity. In November of the same year, the Prime Minister announced that systemic improvements to yen loans and overseas investments and loans would be carried out, such that promotion of the further expansion of high-quality infrastructure would be a matter of policy.

2 Initiatives of the Ministry of Land, Infrastructure, Transport and Tourism

In accordance with the same strategy and by making the most of the aforementioned systemic improvements, MLIT will powerfully advance the overseas expansion of infrastructure systems in the land, infrastructure, transport and tourism sectors. In order to successfully overcome competition from foreign countries and win bids for Japanese companies, we must rely on Japan’s strengths, such as by building safe and reliable systems that combine structural and non-structural aspects, while addressing the needs of recipient countries with flexibility. Therefore, we are planning to promote three pillars of the applicable measures as follows: a. “upstream” planning and information sharing, b. mitigation of business risks, and c. Overseas development of soft infrastructure.

a. ‘Upstream’ Planning and Information Sharing

In order to promote participation from the concept stage of each project (upstream), Japan will appeal its technology to foreign countries, especially how it provides safety, reliability, and superior cost-effectiveness on a comprehensive basis, including with respect to the operations stage. Japan will share these information by utilizing trade promotion activities carried out through joint efforts by leaders in the public and private sectors, organizing city tours and company tours for foreign ambassadors stationed in Tokyo, and taking advantage of opportunities at international conferences.

b. Mitigating business risks

We established the Japan Overseas Infrastructure Investment Corporation for Transport and Urban Development (JOIN) in October 2014 to reduce business risks—such as the huge amount of initial investments, long-term maintenance requirements, and demand risks—incurred by companies expanding into downstream (management and operations) functions in the field of transportation and urban infrastructure. In addition to opening the Overseas Construction Hot Line consultation service in order to help solve problems encountered by companies that are expanding businesses abroad, we are seeking to provide multifaceted support to Japanese companies involved in the overseas development of infrastructure systems by dispatching small and medium-sized companies, sharing updated information through databases on overseas

construction and real estate markets, holding seminars, and supporting overseas development based on the use of intellectual property.

c. Overseas Development of Soft Infrastructure

Various efforts are underway to create an environment ideal for Japanese companies to participate in projects, including international standardization of Japanese technologies and systems and/or become the “de facto standard” of partner countries, support for institutional development of partner countries to improve the business environment for Japanese companies, and support for training engineers and skilled workers that contribute to sustaining administration and maintenance of infrastructure in partner countries.

(1) Promotion of Top Sales

In FY 2015, the Minister of Land, Infrastructure, Transport and Tourism visited South Korea, Turkey, the Philippines, Malaysia, and Laos and engaged in top-level trade promotion activities for Japanese infrastructure systems by holding discussions and exchanging opinions with top officials and cabinet ministers in charge of the land, infrastructure, transport, and tourism sectors in these countries. In addition, the Vice Minister and Secretary visited a total of fifteen countries, including stops in Africa and Latin America, to promote Japan’s infrastructure systems to meet the infrastructure needs of these countries. Additionally, visits to Japan by foreign ministers and dignitaries, the hosting of seminars, and other such opportunities were actively used to tout the superiority of Japanese infrastructure systems.

Column

Strong promotion of top-to-top selling

During FY 2015, the Minister and the State Minister of MLIT and the Parliamentary Vice-Minister conducted sales promotion of Japan’s infrastructure systems to key government officials. Here, four examples around the railway sector are introduced.

(1) Official trip to Malaysia by Keiichi Ishii, Minister of MLIT

In November 2015, Keiichi Ishii, Minister of MLIT, had bilateral talks with each of the ministers of Transport of Malaysia, Singapore, and Thailand about cooperation in top-to-top selling of Japan’s Shinkansen system and, in the transport sector, using the occasion of the ASEAN-Japan Ministerial Conference on Transport. At the same time, while paying a courtesy visit to Malaysian Prime Minister Najib Razak, Ishii had talks with Abdul Wahid Bin Omar, Minister in the Prime Minister’s Department, and Syed Hamid, Chairman of the Malaysian Land Public Transport Commission, separately, on high-speed railways. In the meetings, Ishii explained the superiority of the Shinkansen systems and said that the Japanese government has the intention to provide maximum support financially and in human resources development.

A meeting with Malaysian Minister of Transport Liow.



Source) MLIT

(2) Visit to Japan by Anthony Foxx, United States Secretary of Transportation

In November 2015, Keiichi Ishii, Minister of MLIT, accompanying Anthony Foxx, United States Secretary of Transportation, took a test drive of the superconducting maglev in Tsuru-shi, Yamanashi. After the drive, Transport Secretary Foxx said, “A miracle of transportation has advanced the maglev this far. This is the fruit of research efforts by many people in Japan.”

At the meeting next day, Mr. Foxx, in addition to signing a joint statement to promote cooperation in the transport sector, agreed to have the Japan-U.S. conference on railways in which they exchange opinions about specific cooperation in the railway sector, especially high-speed railways.

United States Secretary of Transportation Foxx visits Japan.

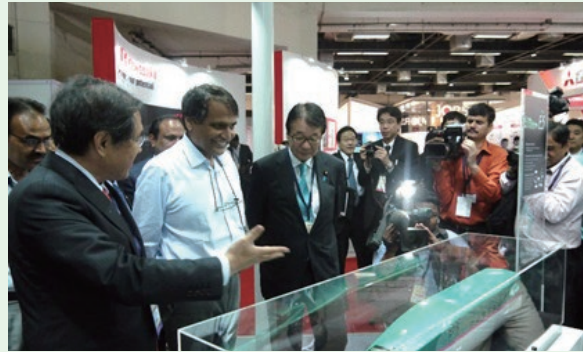


Source) MLIT

(3) Official trip to India by Junzo Yamamoto, State Minister of MLIT

In October 2015, Junzo Yamamoto, Senior Vice-Minister of MLIT, held a seminar on Japan's railway system in India to facilitate the understanding of Japan's high-quality railways from the aspects of financial reasons, safety, sustainability, comfortability, etc. The seminar was well attended by about 150 participants, and some people had to stand. At the same time, Yamamoto met Suresh Prabhu, Minister of Railways, and encouraged the introduction of the shinkansen system to the Mumbai – Ahmedabad High-Speed Railway.

State Minister Yamamoto of MLIT on a business trip to India.



Source) MLIT

(4) Official trip to the United Kingdom by Kiyoshi Ejima, Parliamentary Secretary of MLIT

In November 2015, Kiyoshi Ejima, Parliamentary of MLIT, had a talk with Robert Goodwill, Parliamentary Under-Secretary of State in the Department for Transport in the UK (at the time), and promoted the introduction of Japan's railway system into the high-speed railway plan (HS2) in the UK., besides the 29th session of the IMO.

Ejima Parliamentary Vice-Minister of MLIT Ejima of MLIT meets with Goodwill, parliamentary undersecretary to the UK's Department for Transport.



Source) MLIT

(2) Formulating a Ministry of Land, Infrastructure, Transport and Tourism Action Plan for the Overseas Development of Infrastructure Systems

Demand for infrastructure in neighboring ASEAN countries and other overseas countries is rapidly rising, such that the competition for customers between Japan and her rivals is intensifying. In order to form high-quality infrastructure partnerships as announced by Prime Minister Abe, Japan is reinforcing initiatives launched by the government by expanding systems with the aim of promoting orders and otherwise. The role played by the MLIT in Japan's overseas

development of infrastructure is huge. Existing initiatives will need to be continued and reinforced, the best possible use should be made of the expansion of systems, and new initiatives to deal with current changes in conditions must be undertaken. To this end, the MLIT formulated an action plan (Action Plan for the Overseas Development of Infrastructure Systems). This action plan applies not to different sectors separately but rather on a cross-sectoral basis by region and country. In addition to substantiating and specifying details to a greater degree, such as clarifying priority projects, clarifying the timing according to which actions are to be taken and otherwise, this action plan also incorporates specific measures, such as those pertaining to international standardization, support for Soft Infrastructure (including human resource development and support for the construction of systems), the promotion of participation in PPP projects, the enhancement of strategic promotions, and the overseas deployment of small to medium-sized companies. The MLIT shall strategically carry out the overseas development of high-quality infrastructure systems in line with this action plan according to a schedule deemed to be most effective.

(3) Proactive engagement in PPP projects

The world infrastructure market is projected to continue growing due to rapid urbanization and rapid economic growth in emerging countries. In particular, we are seeing more cases in which infrastructure is being developed through public-private partnerships (PPP) based on the use of private-sector funds and in which the concession method is being adopted for the operations of existing public transportation services. These cases represent a huge business opportunity for private companies. However, transportation and urban development projects are characterized by long-term development windows, demand risks during the operations stage, and the exercising of influence by local government organs, such that participation by only private-sector players is challenging.

For this reason, the MLIT established the Japan Overseas Infrastructure Investment Corporation for Transport and Urban Development (JOIN) in October 2014 to carry out capital investments and participate in projects on an integrated basis in accordance with demand risks in order to help Japanese private companies participate in overseas markets for transportation and urban development. To date, JOIN has decided that it would provide support for three different projects. In September 2015, it organized the First International Seminar on the Overseas Development of the Infrastructure Business jointly with the MLIT and the Japan Bank for International Cooperation (JBIC). In FY 2016, JPY 90 billion was posted to the Fiscal Investment and Loan Program (JPY 38 billion for industry investments and JPY 52 billion for government guarantees). JOIN will continue to be proactively utilized.

Column

Overseas development of infrastructure systems

[Matters decided by Japan Overseas Infrastructure Investment Corporation for Transport & Urban Development (JOIN)]

As for matters decided by the Japan Overseas Infrastructure Investment Corporation for Transport & Urban Development (JOIN) in the period from October 2014, when JOIN was founded, to the end of December 2015 (approved by the Minister of MLIT), the outlines and the importance of the support are introduced here.

(1) Management and operation of Thi Vai International Port near Ho Chi Minh, Vietnam

An investment (approximately 1.2 billion yen) is made to participate in the project of management and operation of the port terminal for importing ferrous scrap in Thi Vai International Port near Ho Chi Minh.

This is the first time for a Japanese port transportation company to participate in port operations in Vietnam and is expected to benefit Japanese-owned companies in Vietnam and contribute to economic development within the country.

Handling of ferrous scrap (illustration).



Source) MLIT

(2) Texas High-Speed Railway Project

An investment (approximately 4.9 billion yen) is made to participate in the project to connect the two cities of Dallas and Houston in the state of Texas by a high-speed railway with travel time of about 90 minutes.

A private company in the United States is advancing the project on the assumption of introducing Japan's shinkansen system (N700-I Bullet), so the investment by JOIN will support the use of the system and enhance the feasibility of the project. In addition, the project will serve as a showcase of the shinkansen system in the United States, which is not yet familiar with the high-speed railway, and will substantially contribute to promote Japan's shinkansen technology outside of Japan.

(3) Project of management and operation of urban railways in Brazil

At three cities including Rio de Janeiro in Brazil, an investment (up to approximately 5.6 billion yen) is made to participate in the collective plan consisting of four projects of a suburban railway, subway line, and two light rail transits.

Japan's investment in the overseas passenger railway project and its full-fledged participation in the operation of the project involving Japanese railway enterprises will realize safe and stable transportation by urban railways through the consignment of Japanese engineers to provide training for local engineers and will contribute to the improvement in urban problems of traffic congestion and environmental pollution.

(Reference) Japanese bullet train system (N700 Series Shinkansen).



Source) MLIT

Rail service on the outskirts of Rio de Janeiro (railway vehicles in motion).



Source) MLIT

(4) Promoting Strategic Publicity

In order to further advance the overseas development of infrastructure systems, initiatives for strategic publicity shall be promoted, such as by producing and effectively highlighting publicity to convey the concept of a *high-quality infrastructure*, a salient feature of infrastructure systems in Japan, in an easy-to-understand manner. In addition to producing videos to specifically convey the concept of high-quality infrastructure and utilizing these videos for top-level trade promotion activities and when dignitaries visit Japan and seminars are held, we will harness online broadcasting channels and transmission media to reach broad audiences in targeted countries and regions.

(5) Initiatives in Different Countries and Regions

In addition to the aforementioned initiatives, public-private partnership-based infrastructure conferences are held to promote greater understanding of high-quality infrastructure investments advocated by Japan as a way to create opportunities to advance the overseas development of infrastructure systems through public-private partnerships. Overseas public-private partnership councils have also been established in different fields of infrastructure—namely eco-cities, water, roads, disaster prevention, rail, ports and harbors, and aviation—to facilitate the sharing of information on Japanese infrastructure.

For example, in developing Talks for Cooperation in Disaster Prevention in the pursuit of solutions for an emerging country dealing with disaster-prevention issues in collaboration with academic, business, and government circles in both countries, Japanese technologies would be introduced and proposed to the government of the other country through a partnership with the Japan Disaster Prevention Platform, an organization building a cooperative framework among academic, business, and government circles established in June 2014. In order to promote such projects as those involving participation in the development and operations of ports and harbors in Myanmar, Kenya, and Mozambique and the introduction of technical standards applicable to ports and harbors in Vietnam, the development of human resources is being enriched, and opinions and data are being exchanged through the Overseas Port Logistics Projects Council. In addition, public-private partnership initiatives are being carried out through the Japan Conference on Overseas Development of Eco-Cities and other such bodies tasked with promoting urban development overseas, and support has been provided for the organization of MIPIM Japan – Asia Pacific 2016 (slated to be held in Osaka in September 2016), a Japanese version of MIPIM, an international real estate show for professionals.

Discussions, collaborations, and other initiatives promoting the overseas development of infrastructure systems and undertaken with different regions and countries in FY 2015 are outlined below.

(i) ASEAN Region

With the establishment of the ASEAN Economic Community (AEC) at the end of 2015, the reinforcement of regional connectivity in this region, which is evolving into a giant single market, is important. In FY 2015, three verification projects—including the introduction of a verification project for the introduction of an overland hub-and-spokes logistics system in the Mekong area—were undertaken as pilot projects for Asian logistics with a view to ultimately facilitating the overseas deployment of high-quality Japanese logistics systems.

In order to form a foundation to facilitate the advancement of Japanese companies into the ASEAN region through the use of the framework provided by the ASEAN-Japan Transport Partnership (AJTP), joint research on paving technologies and overload management technologies in support of global road networks commenced with its acceptance at the ASEAN Transport Ministers Meeting (ATM+Japan), which was held in November 2015. With a focus on spreading superior Japanese infrastructure-related technologies, joint research has been conducted with Indonesia and Vietnam concerning the production of standards applicable to transportation safety and environmental paving. As part of these efforts, a joint workshop featuring technical discussions and the exchanging of opinions on research cooperation was held in Indonesia in FY 2015.

- Indonesia

At the Japan-Indonesia Summit Meeting held in March 2015, it was agreed that a new cooperative framework known as PROMOSI: Japan-Indonesia Investment and Export Promotion Initiative would be launched. Accordingly, the first meeting of the Infrastructure Development Council was held in June where opinions on future infrastructure development projects to be undertaken by and between both countries were exchanged.

In June of the same year, the ninth Indonesia-Japan Conference on Construction was held for the purpose of providing support to companies in the land and construction industry sectors as they strive to enter overseas markets.

In December of the same year, the sixth meeting of the Japan-Indonesia Senior Transport Officials was held in the city of Nagoya. At this meeting, opinions were exchanged on solutions to issues and the future direction of cooperation between the two countries concerning cooperation and recent challenges in different areas of collaboration, including rail, automobiles, ports and harbors, maritime traffic, and aviation. Indonesian officials introduced a new concept of maritime traffic and matters concerning the development of ports and harbors and expressed a high level of interest in the use of IT technology for sustainable traffic networks in major metropolitan areas and in Japanese insight on this topic. Both countries verified that they were committed to continued efforts to promote close ties of cooperation and coordination.

In February 2016, the third meeting of the Japan-Indonesia Senior Construction Officials was held in Tokyo. Information concerning initiatives, issues, and technologies relevant to both countries with respect to three themes—strategic land and infrastructure development, the strategic use of PPP, and ground subsidence and the sustainable and comprehensive management of water resources—was exchanged at the general meeting and information concerning initiatives, issues, and technologies relevant to both countries with respect to roads, water resources, sewage systems, dwellings, and cities was exchanged at individual working meetings. In March of the same year, public-private workshops organized with Indonesia were held as part of the Talks for Cooperation in Disaster Prevention. With the aim of promoting the spread of

Japanese road management technologies, a pilot project concerning asset management was launched. In order to mitigate traffic jams in the Special Capital Territory of Jakarta, cooperation based on a framework of proposed solutions was provided through surveys on actual traffic conditions.

- Thailand

In May 2015, Minister Ohta of MLIT met with Minister Pluajin of the Thai Ministry of Transport and signed a memorandum of understanding incorporating a policy on the adoption of Japanese bullet train technology in connection with a high-speed rail project linking Bangkok with Chiangmai and the commencement of a detailed feasibility study to be undertaken for the rapid implementation of this project and discussions on the applicable business scheme and other pertinent matters. In November, Minister Ishii of MLIT met with Minister Arkhom of the Thai Ministry of Transport and signed a memorandum of understanding dealing with the development and upgrading of railway facilities in the Southern Economic Corridor, railway transportation of cargo, the development of human resources, and other pertinent matters.

- Vietnam

In March 2015, a memorandum of cooperation was concluded between the Department of Surveying and Mapping in Vietnam and the Geospatial Information Authority of Japan to reinforce technical cooperation in the geospatial information sector. In June of the same year, the first senior meeting involving Vietnam's Vice-Minister of Construction was held with Vietnam's Ministry of Construction. Announcements were made and discussions were undertaken on urban development, the development of human resources, and quality-control matters. An eighth intergovernmental meeting was scheduled for October 2015 in accordance with a memorandum of cooperation concerning the sewerage sector that was concluded in 2010 (renewed in March 2014). Support has been provided for the enactment of standards for the pipe-jacking method used for sewage systems, the development of legal systems relating to sewage systems, and the dissemination of pipeline regeneration methods.

In October of the same year, JOIN determined that support would be provided for a project for the development and operations of Thi Vai Port on the outskirts of Ho Chi Minh.

In December of the same year, public-private workshops organized with Vietnam were held as part of the Talks for Cooperation in Disaster Prevention.

In March 2016, the ninth Vietnam-Japan Seminar on Expressway Development was held and Japanese road technology was showcased at this event.

- Malaysia and Singapore

In May 2015, Prime Minister Najib of Malaysia and his wife, as well as the Minister of Transport Liow and others, visited Japan to participate in a summit meeting and gained first-hand experience of riding a bullet train.

In July of the same year, Chairman Hamid of Malaysia's Land Public Transport Commission paid a visit to Japan where he sought to secure the support of Minister Ohta of MLIT for the adoption of a bullet train system.

In November of the same year, Minister Ishii of MLIT visited Malaysia where he met with Prime Minister Najib, Chairman Hamid, Minister of Transport Liow, Wahid, a minister in the Office of the Prime Minister, Singapore's Minister for Transport Khaw, and others and engaged in top-level trade promotion activities concerning high-speed rail plans.

- Myanmar

The third Japan-Myanmar Vice-Ministerial Level Meeting on Construction was held in January 2016 in Myanmar to exchange information regarding the initiatives, challenges, and technologies of both nations as they pertain to the road, city, and housing building and construction industry sectors. At the same time, a comprehensive memorandum of cooperation concerning an urban policy on housing was concluded with Myanmar's Ministry of Construction.

- Cambodia

In June and November 2015, intergovernmental talks were held in Cambodia to introduce relevant systems and case studies in Japan for the development of a business environment for construction and real estate companies in emerging countries.

In June of the same year, a Public Housing Seminar was held as requested by Cambodia and adjustments for the implementation of JICA training by country were undertaken.

In August of the same year, an Urban Transport Seminar was held in Cambodia to promote the overseas expansion of urban transportation systems. In December of the same year, the Cambodia-Japan Expressway Seminar was held to introduce track records and technologies pertaining to Japanese expressways.

We also participated in a FY 2015 detailed survey on the formulation of a plan with a view to implementing the JICA

Project for Reforming the Administrative System Concerning the Vehicle Registration and Inspection Program as requested by Cambodia.

(ii) India

In October 2015, a rail seminar organized through a public-private partnership was held, and it was agreed that a bilateral agreement on a Japan-India joint statement entitled Japan and India Vision 2025 would be issued at the time of the Prime Minister's visit to India in December of the same year. In addition, memorandums of cooperation were concluded by and between the Japanese government and the Indian government on high-speed rail and by and between the Japanese MLIT and India's Ministry of Railways on technical cooperation in the railway sector. An agreement was concluded with the Indian government on the introduction of bullet train technology to be applied to a line connecting Mumbai and Ahmadabad.

In May of the same year, the second meeting of the Japan-India Joint Workshop Group on Road and Road Transport was held. Policies and technologies concerning alpine roads were discussed.

(iii) United States of America

In April 2015, a rail seminar organized through a public-private partnership and at which the governor of the state was able to experience a bullet train simulator was held in California. In November of the same year, JOIN decided that it would provide support for a high-speed rail project for which construction is proceeding on a link between Dallas and Houston, Texas. In the same month, United States Secretary of Transportation Foxx visited Japan and participated in a linear trial run and it was agreed that a Japan-United States Rail Cooperation Council would be established. Domestically in the United States, an application to subsidize the Maglev Deployment Program (MDP) in Maryland was approved by the federal government to constitute an example of an initiative concerning a high-speed rail project in the United States.

In March 2016, an infrastructure seminar was held in the Philippines to promote the deployment in a third country of infrastructure fields for which the American government and companies are collaborating with one another.

(iv) Middle East

As part of the Talks for Cooperation in Disaster Prevention, the Japan-Turkey Disaster-Prevention Cooperation and Technology Fair was held in May 2015 and featured an exhibition and announcements of disaster-prevention technologies by private companies in both countries.

In January 2016, the Turkey-Japan Seminar on Bridge Technologies was held to showcase Japanese bridge technologies for the implementation of bridge projects in Turkey. In March of the same year, the Japan-Turkey Quake-Resistant Construction Seminar was held in an attempt to promote the spread of quake-absorbing and quake-damping technologies.

(v) Russia

Based on a memorandum of cooperation in the field of transportation that was signed by and between the MLIT and Russia's Ministry of Transport, a second senior officials' meeting of the Japan-Russia Working Group on Transportation was held in November 2015 to exchange information on such topics as improvements to and the modernization of the rail system and other transportation infrastructural elements in Russia and safety measures for passage through shipping routes through the Arctic Ocean. Cooperation on urban environmental issues in Russia is being advanced through the Japan-Russia Urban Environment Working Group. The third general meeting was held in June 2015, and the fourth general meeting was held in December, 2015. In these meetings, Japan and Russia decided to jointly support flagship businesses selected by both countries. Also, the two countries agreed to establish the "Japan-Russia Urban Development Platform" as a place for sharing information on urban development businesses and matching Japanese and Russian companies.

(vi) Central Asia

Around the time of the Prime Minister's visit to the central Asian region in October 2015, public-private infrastructure conferences were held in Uzbekistan in September of the same year and in Kazakhstan in November of the same year. In addition to promoting an understanding of high-quality infrastructure investments in the central Asian region, initiatives to support local inroads and business development by companies with ties to Japanese infrastructure were advanced.

Furthermore, Minister Ishii of MLIT signed a memorandum of cooperation for the purpose of promoting infrastructure development, technical cooperation, and private-sector business across all transportation sectors with Kazakhstan's Ministry for Investments and Development in the same month.

(vii) Latin America

In December 2015, JOIN determined that it would provide support concerning projects for the development and operations of urban railways in three cities of Brazil (Rio de Janeiro, Sao Paolo, and Goiania).

(viii) Africa

In advance to the TICAD VI to be held in the summer of 2016, MLIT organized public-private infrastructure conferences in Ethiopia and Kenya in July 2015 and in Mozambique and Tanzania in January 2016. Along with promoting an understanding of high-quality infrastructure investments, initiatives to support infrastructure business development of Japanese companies in the target countries were advanced.

Column The international real estate exhibition was staged in Japan for the first time as MIPIM JAPAN

The international real estate exhibition, MIPIM (Marche International des Professionnels de l'Immobilier), which has been held in Cannes, France, over a quarter-century since 1990, was staged in Tokyo for the first time as MIPIM JAPAN over the two days of May 20 and 21, 2015, under the auspices of the MLIT, the Tourism Agency, and the Financial Services Agency.

MIPIM provides the opportunity for investors, developers, design companies, manufacturers, and municipalities to get together to collect information and have business negotiations on urban and real-estate development, discover new markets, and promote cities. In Cannes in March 2015, there were approximately 23,000 participants from 89 countries and regions around the world, which is said to be the world largest event related to real estate.

The first MIPIM JAPAN involved over 2,500 participants from 30 countries and regions worldwide and consisted of more than 40 conferences, exhibitions by 56 companies and local governments within and outside Japan, and networking events to expand connections among participants. In the keynote speeches, Hiromichi Iwasa, Chairman of the Real Estate Companies Association of Japan and the Association for Real Estate Securitization, and Yoichi Masuzoe, Governor of Tokyo, conveyed messages to encourage investment in Japan.



In the opening party, Minister Ohta of MLIT (at the time) said that he would turn Japan's cities into stages for international exchanges and that he was certain that Japan's technology and expertise in urban development would contribute to the improvement of cities in the world.

In September 2016, MIPIM JAPAN—ASIA PACIFIC 2016 is scheduled for Osaka. MLIT will continuously make efforts to firmly establish international MICE (Meeting, Incentive tour, Conference or Convention, and Exhibition) on the subject of real estate.



Source) Tokyo office of Reed MIDEM.



Section 2 Promotion of International Cooperation and Negotiations

1 Initiatives in the Field of Economic Partnerships

(1) Trans-Pacific Strategic Economic Partnership (TPP) Agreement

The TPP Agreement constitutes an economic partnership agreement forming the basis of rules governing trade and economic activities in the Asia-Pacific region, which accounts for forty percent of global GDP, as well as a pillar for a Japanese growth strategy to help the Asia-Pacific region grow. Japan participated in negotiations in July 2013 and a broad outline of the TPP Agreement was agreed to in October 2015. The key provisions of the agreement as it affects the land, infrastructure, transport, and tourism sectors entailed an agreement to promote the international harmonization of environmental and safety standards for automobiles without lowering domestic standards. As for government procurement activities, general competitive bidding will be newly mandated in Malaysia, Vietnam, and elsewhere, a change that is expected to lead to the promotion of the overseas development of Japanese infrastructure systems. In November of the same year, the government compiled a comprehensive set of TPP-related policy principles to directly tie the TPP to economic revitalization and the emergence of regions in Japan.

(2) Japan-EU EPA and other Economic Partnership Agreements and Free Trade Agreements (EPA/FTA)

Japan is strategically promoting economic partnerships with the Asia-Pacific region, the East Asia region, Europe, and elsewhere. As of March 2016, EPAs with fifteen countries and regions (excluding the TPP) have been put into effect, signed, or are otherwise under negotiations with a view to eventually being concluded, examples of which include the Japan-EU EPA and the Regional Comprehensive Economic Partnership for the East Asia region (RCEP). These arrangements will serve to strengthen the international competitiveness of Japan's transport, construction, and other industries, promote international development and the opening of the service sector in partner countries, including by way of the abolition or deregulation of foreign capital restrictions, and promote the expansion of participation opportunities relating to government procurement.

It was decided that negotiations for a Japan-EU EPA would be commenced in March 2013. Fifteen negotiation sessions have been held as of March 2016. At a meeting of the EU heads of state or government in November 2015, all parties agreed to continue making maximum efforts to secure an agreement, in principle, on the major elements before the end of

the year and, in the event that no such agreement could be secured, to aspire to agree in principle on the major elements as early as possible in the following year. The entire Japanese government, including the MLIT, has thus accelerated its efforts to facilitate the conclusion of an agreement at the earliest possible point in time.

Sixteen countries, including the countries of the ASEAN bloc, China, South Korea, and Australia, are participating in negotiations with respect to the RCEP. These negotiations began in May 2013 and eleven negotiation sessions have been held as of March 2016.

(3) World Trade Organization (WTO)

Discussions among like-minded countries and regions, including Japan, have been undertaken with a view to enacting a new Trade in Services Agreement (TiSA) in order to further liberalize trade in service sectors. Negotiations began in June 2013.

2

Contributions to and the Strategic Use of International Organizations

(1) G7 Transport Ministers' Meeting in Karuizawa, Nagano

In 2016, Japan will preside over the G7 Summit. In addition to hosting the Summit at Ise-Shima in May, we will be holding ten relevant ministers' meetings at different locations across the country.

The MLIT is slated to host a meeting of the G7 Transport Ministers in Karuizawa, Nagano Prefecture, in September of the same year. At this meeting, discussions on *developing and disseminating the latest technologies concerning automobiles and roads* and *basic strategies for dealing with the development and obsolescence of transportation infrastructure* are expected to be undertaken based on discussions that took place at the meeting of the G7 Transport Ministers held in Germany in September 2015.

(2) Asia-Pacific Economic Cooperation (APEC)

APEC is a framework for economic cooperation through which activities to promote trade and investment liberalization, business facilitation, economic and technical cooperation, and other such objectives are carried out to promote the sustainable growth and prosperity of the Asia-Pacific region. The MLIT is proactively involved in ministers' meetings and working groups that pertain to APEC's transportation and tourism sectors.

In the transportation sector, meetings of the transportation ministers to facilitate the flow of goods and people and support trade and investment within the given area are held. At the eighth APEC Transport Ministers' Meeting held in Tokyo in September 2013, the topic of enhancing connectivity through high-quality transportation within the APEC region in terms of basic themes was discussed. As proposed by Japan, the ministerial joint statement that was released at the time came to incorporate three concepts constituting the keys to the development of transportation in the APEC region: enhancement of connectivity, development of a transportation infrastructure based on the use of private funds, and deployment of high-quality transportation. At the ninth APEC Transport Ministers' Meeting held in the Philippines in October 2015, Japan presented a report on three initiatives that resulted from discussions that were held at the eighth APEC Transport Ministers' Meeting: (i) connectivity map; (ii) sharing of best practices for infrastructure investing, financing, and operations for which the experiences of member countries and regions are brought to bear; and (iii) high-quality transportation vision with a focus on convenience, safety, and environmental protection.

(3) Association of Southeast Asian Nations (ASEAN)

The MLIT is involved in various cooperative projects under the "ASEAN-Japan Transport Partnership," a cooperation framework in the transport sector founded between Japan and ASEAN in 2003. The "ASEAN-Japan Ministerial Conference on Transport" is held every year to monitor the progress of current projects and to discuss new projects and future direction.

At the "13 ASEAN-Japan Ministerial Conference on Transport" held in Malaysia in November 2015, approval was granted for the ASEAN-Japan Transport Partnership Work Plan 2015–2016, a specific implementation plan for the ASEAN-Japan Transport Partnership, as well as for four new cooperation projects: (i) a new ASEAN-Japan environmental action plan in the transport sector, (ii) Joint Research on Road Technologies for ASEAN Cross-Border Corridors, (iii) cooperation with respect to maritime safety (VTS human resources development and cooperation project), and (iv) a new

ASEAN-Japan cooperation program concerning comprehensive transportation safety and environmental measures, including with respect to automobile standards and certification systems. Four documents were also approved as the result of projects implemented to date: (i) a document compiling positive case studies of transportation safety and disaster prevention, (ii) a document compiling positive case studies of PPP, (iii) a report on a survey for the realization of a land bridge, and (iv) a green logistics vision and action plan.

At the twenty-seventh ASEAN Summit held in November 2015, a declaration announcing the year-end establishment of an ASEAN Community that includes the ASEAN Economic Community (AEC) made and a new action plan setting forth 2025 as the new target year for integration was adopted. A new action plan for the transportation sector effective between 2016 and 2025 was also approved at the twenty-first ASEAN Transport Ministers' Meeting held in November of the same year.

(4) Organization for Economic Co-operation and Development (OECD)

The MLIT participates in the activities of multiple OECD organizations, including the International Transport Forum (ITF), the Council Working Party on Shipbuilding, the Regional Development Policy Committee (RDPC), the Tourism Committee, as well as the Joint Transport Research Centre, which was jointly established by OECD and ITF.

The ITF is an international framework in which transport ministers from 57 countries play a central role in annual meetings to facilitate high-level and open discussions with world-renowned experts and business persons regarding transport policy. Previous topics discussed include climate change in the transport sector and globalization. At a ministers' meeting in May 2015, discussions based on a theme of transportation, trade, and tourism were held with an exploration of various different perspectives. Participants discussed how the global increase in demand for transportation caused by rising trade volumes and numbers of tourists should be handled and how transportation capable of accommodating environmental and other socioeconomic burdens should be configured.

In order to ensure fair competitive conditions in the shipbuilding market, the OECD Council Working Party on Shipbuilding strives to enhance policy transparency by conducting reviews of the shipbuilding policies of different countries and producing policy support tables. Discussions on resolving the recent problem of excess supply that constitutes a factor behind the cutthroat competition that can be seen in the global shipbuilding market are being held through the exchange of information on policies taken by each country.

The RDPC proactively conducts reviews of the policies of member countries with respect to land and regional policies, studies on urban policies in the context of green growth strategies, and surveys on sustainable urban policies and resilient cities in an aging society. In addition, a second review by country was conducted on Japan's land and regional policies over FY 2014–2015. This review positively recognized that Japan, a society that is undergoing a population decline and is aging at the same time, is attempting to convert this crisis into an opportunity through a long-term, comprehensive land plan and was adopted by the RDPC in November 2015.

The JTRC conducts surveys and research on policy issues commonly applicable to member countries. Japan also participates in a working group focused on Safe System Implementation to dealing with road traffic safety concerns. A program on the sensible uses of roads as proposed by Japan for 2016 and beyond was adopted and put into effect in March 2016.

(5) United Nations (UN)

(i) International Maritime Organization (IMO), and International Labor Organization (ILO)

In the maritime sector, in addition to responding to the IMO global agenda, bilateral talks were held at the Director level. A Japanese official served as Secretary-General of the IMO (until the end of 2015) and Japan itself proactively participates in the activities of this organization as a leading shipping and shipbuilding nation in the world. In FY 2015, we proactively contributed to discussions on measures to reduce greenhouse gas emissions from ships and on putting the International Convention for the Control and Management of Ships' Ballast Water and Sediments into effect, the enactment of standards applicable to ships navigating the Arctic Ocean and other polar seas in response to focus placed on the adoption of new routes, the enactment of requirements for the training of onboard crewmembers, and the enactment of safety standards applicable to ships that use natural gas, which is characterized by a low environmental load and excellent economic efficiency, for fuel.

Efforts have also be undertaken to ensure appropriate compliance with stipulations governing appropriate onboard

working and living conditions as prescribed by the ILO Maritime Labor Convention of 2006, which came into effect in Japan in 2014.

(ii) International Civil Aviation Organization (ICAO)

The ICAO is a specialized agency of the United Nations that has set forth certain rules and other stipulations for the safe and orderly development of international civil aviation and the sound and economic operations of international air transportation. Japan's financial contributions are second among member countries and Japan, as a Governing Council country under PART I (States of chief importance in air transport), actively participates in various ICAO activities and contributes to the development of civil aviation.

As part of a task force that formulates recommendations on the establishment of a system for reducing greenhouse gas emissions in the field of international aviation, Japan has made a number of proactive contributions, such as by way of the appointment of a co-chairperson in March 2014.

(iii) UN-Habitat

UN-HABITAT is a UN funding and planning agency specializing in human settlement issues. Japan has been an active council participant since the foundation of UN-HABITAT, and has taken advantage of its knowledge and record of accomplishment on improving land, regional, and residential environments to contribute to improving human settlement issues worldwide, with particular focus on the Asian population explosion and rapid urbanization.

In October 2016, Habitat III, a UN summit that has been held every twenty years and that involves discussions on international initiatives on human settlements and a summarization of the global agenda in this field, is slated to be held in Ecuador. Japan established a domestic council (co-chaired by the Ministry of Foreign Affairs and MLIT) in April 2014 and has submitted a country-by-country report summarizing Japanese efforts and proactively shared information on its knowledge and experience with respect to land and regional policy during preliminary talks.

(iv) United Nations Special Thematic Session on Water and Disasters

The United Nations Special Thematic Session on Water and Disasters is a high-level session attended by top officials of United Nations agencies and cabinet ministers from different countries. This session is organized to discuss initiatives of the international community in hopes of advancing water-related disaster countermeasures as adopted by each country. At the second high-level panel debate for this session, which was held in the United States (New York) in November 2015, Minister Ishii of MLIT spoke of the Great East Japan Earthquake, numerous floods, and other such events experienced by Japan and of the water-related disaster countermeasures that we have put into place based on the lessons that we learned through these events. He also emphasized how important it is for each country to regularly secure opportunities to share experiences and knowledge on water-related disasters and learn from one another if we are to reinforce water-related disaster countermeasures around the world. With respect to the High-Level Expert Panel on Water and Disasters, which aims to fortify water-related disaster initiatives undertaken by different countries, we participated in the fifth (April 2015) and sixth (November 2015) sessions and shared information on measures for adapting to climate change and other pertinent matters.

(6) World Bank (WB)

The MLIT and WB jointly hosted an international conference on "Sustainable development through Quality Infrastructure Investments" in January 2016 in order to effectively share knowledge on Quality Infrastructure Investments with infrastructure officials in other countries. In addition, based on a chair summary of the Japan-OECD Policy Forum Concerning Urban Development and Green Growth (October 2014), MLIT and WB jointly hosted online seminars on Transit Oriented Development (TOD) in June and October 2015 to share knowledge on Japanese urban development with other Asian countries.

3 Multilateral and Bilateral International Negotiations and Collaborative Initiatives in Different Sectors

(1) National Land Policy Sector

Director-general-level talks are regularly held with South Korea, and information concerning similar issues affecting both countries, such as in terms of national land policy, regional policy, and land policy is exchanged. The twentieth such meeting was held (by Japan) in August 2015. Opinions on national land policy and regional development policy are exchanged with France through the Secretariat (CGET, former DATAR, National Land Development and Regional Competitiveness Agency) of the French Land Equality Commission. Preparations for quickly concluding a technical cooperation agreement with Kuwait are being made in accordance with a memorandum of agreement to promote policy dialog pertaining to the formulation of a new national development plan, which was concluded with that country in 2013.

(2) Water Sector

The Minister of Land, Infrastructure, Transport and Tourism chaired one of the Ministerial Roundtable titled ‘Integrated Water Resources Management’ under 7th World Water Forum, which was held in Republic of Korea in April 2015. In this and other ways, we have proactively engaged in discussions concerning water issues at various international conferences and have issued statements on reinforcing initiatives concerning water, sanitation, and disaster prevention.

Furthermore, Japan is coordinating efforts with the United Nations Educational, Scientific and Cultural Organization (UNESCO) and Network of Asian River Basin Organizations (NARBO) to contribute to the dissemination and promotion of Integrated Water Resources Management (IWRM).

Bilateral meetings pertaining to rivers, sediment control facilities, and water resource management have been held with the United States, China, and South Korea to promote information exchange, technical cooperation, and other such outcomes.

In addition, the Water and Environmental Solution Hub, an alliance of local governments; the Japan Sewage Works Agency; the MLIT; and others has provided expertise on sewage works to developing countries through seminars, training, and other programs.

(3) Disaster Prevention Sector

To reduce the occurrences of water disasters in the world, in addition to disseminating Japan’s experiences and technology, efforts are being made to establish solidarity regarding the strengthening of water disaster prevention measures in order to build an international consensus that disaster prevention is the key to sustainable development. The International Centre for Water Hazard and Risk Management (ICHARM), which was founded by a national research and development corporation known as the Public Works Research Institute, has engaged in the development of an integrated flood analysis system (IFAS) and rainfall-runoff-inundation (RRI) model, research on risk management, the cultivation of human resources through the use of the results of the foregoing, and the provision through UNESCO and Asian Development Bank projects of technical cooperation and international assistance for countries and regions susceptible to water damage.

In accordance with a letter exchanged in March 2013 between the EU’s General Office on Disaster Prevention and the MLIT, working level talks were held in December 2015 for the purpose of enhancing disaster prevention measures in place in both Japan and the EU. In November of the same year, the fourth Japan-Brazil Joint Committee on Cooperation in Science and Technology (Tokyo) was held. Superior sediment control technology possessed by Japan was introduced and information and opinions were exchanged. In addition, experts dispatched by MLIT have been providing technical advice on understanding disaster conditions and future countermeasures.

(4) Road Sector

Japan has been proactively participating in various technical committees of The World Road Association (WRA) and spearheading the formulation of a future policy. At the twenty-fifth World Road Congress held in Seoul, South Korea, in November 2015, Initiatives for the Smart Use of Roads based on the use of ETC2.0 were introduced as part of a new Japanese road policy.

(5) Housing and Building Sector

Japan attended the world conference of the Inter-Jurisdictional Regulatory Collaboration Committee (IRCC) and exchanged information with partner countries concerning trends in building codes.

Bilateral talks were held with China, Germany, Myanmar, and Indonesia concerning housing policy, energy-saving buildings, and housing for the elderly.

Broad technical cooperation was provided to Myanmar through the dispatching of JICA experts and other measures. Public housing seminars were held in Cambodia as requested by minister of Cambodia.

(6) Automotive Sector

In November 2015, the “ASEAN-Japan new cooperative program on comprehensive vehicle safety and environment measures including development of technical regulations and establishment of a type approval system for vehicles” was endorsed at the thirteenth ASEAN-Japan Transport Ministers Meeting in order to expand the scope of the existing cooperation program. Accordingly, the Public-Private Joint Forum for the Asian region was held in November of the same year. In the forum, information about the activities for the global harmonization of vehicle regulations and mutual recognition of type approvals were exchanged. In December of the same year, the 6th Japan-China Automobile & Traffic Exchange Promotion Meeting was organized together with China and opinions were exchanged on various topics, including safety management by road transportation operators and the vehicle inspection system for commercial automobiles.

(7) Maritime Sector

In the maritime sector, in addition to responding to the IMO global agenda, bilateral talks were held at the director level. In FY 2015, talks at the level of directors-general were held with India, the United States, the EU, and South Korea, at which time information was shared and opinions were exchanged with respect to ship recycling, measures to reduce greenhouse gas emissions, ballast water management, cyber-security, and other pertinent issues. The Joint Hydrographic Surveys of the Straits of Malacca and Singapore began to update electronic navigational charts in October 2015. A model route survey for cruise ships was carried out in accordance with the ASEAN-Japan Cruise Promotion Strategy that was approved at the ASEAN-Japan Transport Ministers Meeting in 2014.

(8) Ports Sector

The latest information on the administration of ports and harbors is being exchanged and measures to promote cruise ship operations and the overseas deployment of Japanese technical standards are being carried out through various international conferences, such as the Northeast Asia Port Director-General Meeting, meetings of APEC’s Transportation Working Group, and meetings of the World Association for Waterborne Transport Infrastructure (PIANC).

(9) Aviation Sector

In April 2015, the first meeting of the Japan-France Cooperative Working Group was held in accordance with a memorandum of understanding concerning technical cooperation in the civil aviation sector that had been concluded with France. It was decided to advance cooperation including regular meetings to be held in the future.

At the fifty-second Conference of the Directors General of Civil Aviation in the Asia and Pacific Regions held in October of the same year, we exchanged opinions on various initiatives being undertaken by different countries in the Asia and Pacific regions concerning aviation in general, including with respect to the expansion of air traffic capacity, environmental measures in the aviation sector, and the education and training of aviation specialists.

(10) Logistics Sector

Trilateral cooperation among Japan, China, and South Korea is being advanced in the logistics sector in accordance with an agreement reached at the fifth China-Japan-Korea Ministerial Conference on Transport and Logistics held in August 2014, such as by way of studies into the expansion of the mutual transiting of chassis, the expansion of ports and harbors in Japan, China, and South Korea that are subject to the Northeast Asia Logistics Information Service Network (NEAL- NET), and the expansion of such ties to ASEAN countries and other partners.

Discussions on enhancing the logistics environment are also being carried out in the context of bilateral policy dialog

under the framework of the ASEAN-Japan Transport Partnership. Dialog sessions on logistical policy were held in Cambodia and Laos in October 2015 and Malaysia in February 2016. In March 2016, students were provided with development training in Vietnam to help secure exceptional human resources in the ASEAN region.

(11) Geospatial Information Sector

In addition to dispatching staff members to the United Nations Committee of Experts on Global Geospatial Information Management (UNCE-GGIM) and contributing to adaptation of UN General Assembly resolution on the establishment of a Global Geodetic Reference Frame (GGRF), we have dispatched a staff member as President to the Regional Committee of UN-GGIM for Asia and the Pacific (UN-GGIM-AP) and made contributions to the development and utilization of geospatial information for the region.

(12) Meteorological and Earthquake/Tsunami Sector

Under the framework of the World Meteorological Organization (WMO), Japan has provided various information including tropical cyclone forecasts taking advantage of its advanced technologies as well as exchanged meteorological data and technical information with the world meteorological community. Also, under the framework of the United Nations Educational, Scientific and Cultural Organization (UNESCO) Intergovernmental Oceanographic Commission (IOC), Japan has provided the Northwest Pacific Tsunami Advisory to various countries in the region to contribute to tsunami disaster mitigation.

(13) Coast Guard Sector

Coordination and cooperation among coast guard organizations in various fields—including search and rescue as well as maritime security measures—are being actively promoted through partnership of the North Pacific Coast Guard Forum (formed by six countries consisting of Japan, Canada, China, South Korea, Russia, and the United States), the Heads of Asian Coast Guard Agencies Meeting (19 Asian countries and one region), and bilateral top-level meetings, as well as joint exercises.

Japan is also proactively participating in various international organizations by formulating standards concerning the production of nautical charts through committees of the International Hydrographic Organization (IHO), coordinating for the Northwest Pacific Ocean region through the Cospas-Sarsat Programme, conducting investigations into AIS development through committees of the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), and dispatching staff members of the Japan Coast Guard to the Information Sharing Center based on the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP). In addition, international contributions are being made through different initiatives, such as those that help improve the capabilities of the coast guard sector in developing countries.

(14) International Transportation

The eighth Japan-China High-Level Talks on Transportation were held for the first time in four years in Beijing, China, in January 2016 to facilitate policy dialog at a vice-ministerial level between Japan and China on issues facing both countries in the transportation sector. It was decided that cooperation through the bilateral exchange of information would continue to be advanced with respect to initiatives for ensuring safety in the transportation sector, responses to large-scale disasters, and the maintenance and securing of transportation and logistical services in the region. In the maritime sector, it was agreed that the importance of cooperation through activities sponsored by the International Maritime Organization (IMO) would be confirmed and that talks at the level of maritime bureau directors-general would be held.

With respect to relations with South Korea, vice-ministerial talks have been held for the purpose of coordinating policy at a high level in the transportation sector in accordance with an agreement concluded at The Japan-Republic of Korea Ministerial Meeting held in 1999. In March 2016, the 11th Meeting of Japan-Korea Transport Cooperation Conference were held in Matsuyama City, Ehime Prefecture, where opinions were exchanged on various topics, including initiatives and issues concerning the realization of automated driving operations, the expansion of and logistics concerning the Internet mail order market, enhancing the convenience of public transit, and regional revitalization.

Section 3 Initiatives Towards International Standardization

(1) Efforts for International Standardization

To promote high safety and environmental performance automobiles early and cost efficiently, Japan is actively participating in activities of the World Forum for Harmonization of Vehicle Regulations (WP.29) to promote the international harmonization of safety and environmental regulations, and is also promoting the international spread of Japanese automobiles with superior safety, and environmental features, and new technology through participation in these activities. In order to promote such activities, the “Action Plan for the Internationalization of the Regulation and Certification System” with its four pillars of: 1) Strategic international standardization of Japanese technology and regulations, 2) Realization of international whole vehicle type approval system (IWVTA), 3) Promoting participation of Asian countries in international harmonization of regulations, and 4) Establishing a framework to handle globalization of regulations and certification, is being steadily realized to promote the internationalization of automobile regulation and certification systems.

(2) Internationalization and Other Initiatives in the Railway Sector

As Europe actively promotes the international standardization of European standards, the possibility of significant obstacles arising in the overseas expansion of railway systems is increased if Japan’s superior technology is excluded from the scope of international standards. Because this will affect global competitiveness in the railway sector, it is important to actively promote international standards in railway technology. For this reason, the Railway Technical Research Institute’s Railway International Standards Center, which is the centralized organization that handles railway-related international standards, works proactively to further advance railway safety and the expansion of the railway industry.

As a result, Japan has played a central role in contributing to the proposals of individual standards and committee activities in the Technical Committee for Railway Applications (TC269) of the International Organization for Standardization (ISO), and secured successful results. As this country’s profile in various international conferences, including those organized by ISO/TC269 and the Technical Committee for the Railway Sector (TC9) of the International Electrotechnical Commission (IEC), has risen, efforts have been directed at promoting international standardization with respect to railway technology. The National Traffic Safety and Environment Laboratory (Independent Administrative Institution), the first domestic certification body of international standards in the railway sector, has acquired solid certification experience following the establishment of the Certification Office, and contributed to the international expansion of Japan’s railway systems.

(3) International Standards Regarding Ships and Mariners

In order to aim to mitigate the environmental impact and increase the safety of shipping and help disseminate superior Japanese energy-saving technologies, Japan has spearheaded discussions in the context of the formulation of standards under the SOLAS Convention ^{Note 1}, MARPOL Treaty ^{Note 2}, and STCW Convention ^{Note 3}, all of which have been adopted under the auspices of the International Maritime Organization (IMO). In terms of support for the ASEAN region, we have helped improve and harmonize ship-safety regulations in the ASEAN region, such as by working to have the conclusion of a memorandum of agreement that includes the use of guidelines on safety regulations provided by Japan agreed to among member countries.

Moreover, the Japan Coast Guard has participated in discussions on international standards applicable to nautical charts, nautical publications, and navigation warnings as hosted by a working group operating under the auspices of the International Hydrographic Organization (IHO). In order to ensure the safety of vessel traffic and increase the operating efficiency of vessels, we have invited international conferences to Japan and otherwise spearheaded the international standardization of VDES ^{Note 5}, a next-generation AIS ^{Note 4}. In February 2016, the Japan Coast Guard invited workshops

Note 1 International Convention for the Safety of Life at Sea.

Note 2 International Convention for the Prevention of Pollution from Ships.

Note 3 International Convention on Standards of Training, Certification and Watchkeeping for Seafarers.

Note 4 Automatic Identification System used for identifying and locating vessels.

Note 5 VHF Data Exchange System.

organized by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) to Japan in order to proactively incorporate Japanese opinions into the draft plans for performance standards applicable to VDES.

(4) International Harmonization of Standards and Certification Systems in the Civil Engineering and Building Sectors

In the civil engineering, building, and housing sectors, we are working to promote the international harmonization of standards and certification systems by operating programs for certifying imported building materials in terms of performance and for approving rating agencies, obtaining technical cooperation from organizations like JICA, and participating in the establishment of ISO standards for design and construction technology. Likewise, as part of the efforts to incorporate Japan's accumulated technology in international standards, discussions are in progress to develop and revise domestic technical standards by taking into account trends in the creation of international standards.

(5) International Standardization of Intelligent Transportation Systems (ITS)

In order to promote the development of efficient applications, international contributions, and the development of related industries in Japan, the international standardization of ITS technology is progressing within international standardization bodies, including ISO and the International Telecommunication Union (ITU).

In particular, we are participating in the Technical Committee on International Standardization of the ITS (ISO/TC204) and have been engaged in standardization activities concerning the use of probe data gathered with the ETC2.0 service. Japan has spearheaded the formulation of international regulations governing automatic driving, such as by co-chairing the Intelligent Transport Systems and Automobile Driving Informal Working Group and Automatically Commanded Steering Function Informal Working Group, which were established under the United Nations' World Forum for Harmonization of Vehicle Regulations (WP.29) and proposing regulations for automatic steering to enable automatic driving on expressways.

(6) Standardization of Geographic Information

For the purpose of ensuring compatibility for the interoperability between Geographic Information System (GIS) with differing geospatial information, Japan is actively participating in the formulation of international standards by the ISO technical committee for Geographic information/Geomatics (ISO/TC 211). Likewise, initiatives are taking place to standardize domestic geographic information.

(7) Mutual Recognition of International Technical Qualifications

The APEC Engineer Mutual Recognition Project aims to provide mobility to qualified technical personnel based on the mutual recognition of technical qualifications among participating countries and regions. Within the APEC Architect Project (system for registering architects), Japan signed bilateral memorandums of understanding for mutual acceptance with Australia in July 2008 and New Zealand in July 2009 to promote the mobility of persons qualified to produce architectural designs.

(8) Sewerage Sector

Based on the Intellectual Property Strategic Program, strategic international standardization is being promoted for the purpose of creating an international market where Japanese companies looking to expand internationally in the sewerage sector can be highly competitive. Presently, we are promoting the formulation of international standards to ensure the proper recognition of relevant Japanese sewage technologies through our proactive and leading participation in the Technical Committee on the Re-Utilization of Water (ISO/TC282), Technical Committee on Sludge Recovery, Recycling, Treatment, and Disposal (ISO/TC275), and Working Group on Rainwater Management (ISO/TC224/WG11).

Chapter 10

Utilizing ICT and Promoting Technology Research and Development

Section 1

Promoting Innovation in the Fields of Land, Infrastructure, Transport, and Tourism Through the Use of ICT

Information technology initiatives in the fields of land, infrastructure, transport and tourism within the Declaration to be the World's Most Advanced IT Nation (revised on June 30, 2015) are being promoted in coordination with the IT Strategic Headquarters (Strategic Headquarters for the Promotion of an Advanced Information and Telecommunications Network Society) as headed by the Prime Minister.

1 Promoting ITS

Intelligent Transport Systems (ITS), a system created through the integration of people, roads, and vehicles using the latest Information and Communications Technology (ICT), enables advanced road use, the safety of drivers and pedestrians, the dramatic improvement of transport efficiency and comfort, solves various social problems such as traffic accidents and congestion, environmental and energy problems, and is leading to the creation of new markets in the related fields of the automotive industry, information technology industry, and others.

We are also proactively promoting initiatives pertaining to the collection and distribution of road traffic information effective for safety measures, congestion measures, and disaster countermeasures in accordance with our aim to realize the world's safest, environmentally friendly, economical road traffic society based on our Declaration to be the World's Most Advanced IT Nation, which was endorsed by the Cabinet in June 2013 and revised in June 2014 and June 2015, and our Public-Private Partnership-Based ITS Concept and Roadmap, which was endorsed by the IT Strategic Headquarters in June 2014 and revised in June 2015.

(i) The Spread of ITS in Society and its Effect

(A) Promotion of ETC and its Effects

Electronic Toll Collection (ETC) is now available on all national expressways, as well as most of the toll roads in Japan. The total number of new setup onboard units is roughly 51.25 million as of September 2015 and its usage rate on all national expressways is roughly 90.0%. Congestion at tollgates, which used to account for roughly 30% of the cause for expressway congestion, has been mostly alleviated and has contributed to reductions in CO₂ emissions and environmental burdens. Additionally, measures utilizing ETC are being implemented, such as the introduction of Smart IC dedicated to ETC interchange and discounts for ETC vehicles. In addition to such toll road uses, it is also possible to use ETC for parking payments and boarding procedures for ferries, showing the spread and diversification of services utilizing ETC.

(B) Improvement of Providing Road Traffic Information and its Effects

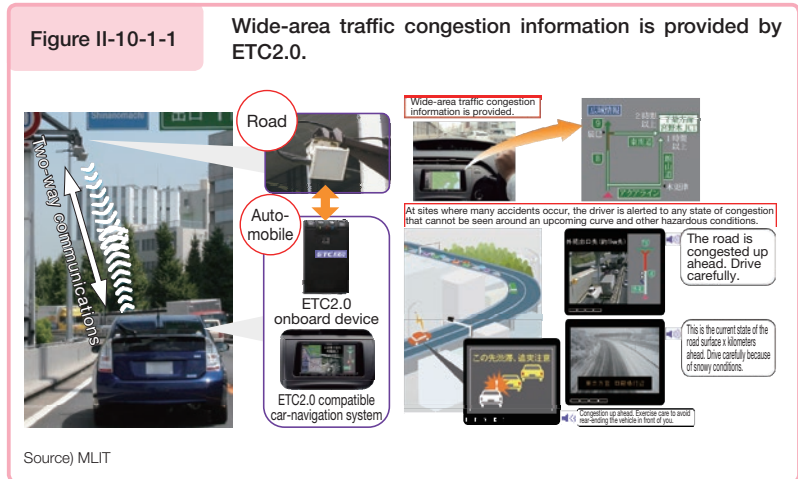
Vehicle Information and Communication System (VICS)-compatible onboard units aim to advance travel route guidance and, as of September, 2015, roughly 48.37 million units have been shipped. By providing road traffic information such as travel time, congestion conditions, and traffic restrictions in real-time through VICS, drivers' convenience is improved. This ultimately contributes to better mileage and reduces environmental burdens, including the reduction of CO₂ emissions.

(ii) Technological Development and the Popularization of New ITS Services

(A) Utilizing ETC2.0

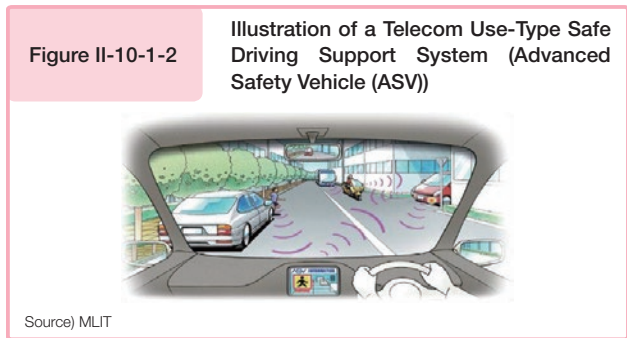
We are committed to promoting several "smart use of roads" measures. These include introduction of flexible toll rates to reduce congestion and accidents and promotion of highly productive logistics management system, through the use of

vehicle speed data, travelled route and travel time data, and other various big data carefully collected from the ETC2.0 onboard units, which became available in the market in August 2015.



(B) Promotion of the Advanced Safety Vehicle (ASV) Project

Regarding the ASV promotion plan, efforts are underway for the development, commercialization, and widespread adoption of Advanced Safety Vehicles (ASV) that assists the drivers to drive safely by using advanced technology such as ICT technology. In FY 2015, studies were conducted on measures to counter driver overconfidence, the trend towards greater complexity in systems, and the promotion of the development of safe driving support systems based on the use of communications, including communications between vehicles and communications between pedestrians and vehicles.



2 Realizing Automatic-Driving Systems

Japan has been appointed to jointly chair the Intelligent Transport System and Automatic Driving Informal Working Group (established in November 2014) and the Automatically Commanded Steering Function Informal Working Group (established in February 2015), which were established under the UN World Forum for Harmonization of Vehicle Regulations (WP.29), and is spearheading studies of international safety regulations applicable to automatic driving systems.

Domestically as well, we will engage in studies on demonstration experiments for the commercialization of communications-based driving support systems and on safe and smooth methods of system communications with drivers in the context of the Cross-ministerial Strategic Innovation Promotion Program (SIP), a collaborative measure undertaken by relevant ministries and agencies. A meeting to review the automatic-driving business was held jointly with the Ministry of Economy, Trade and Industry and the direction that automatic-driving systems should take as we focus on a point fifteen years down the road and the issues that need to be addressed for the realization of this direction were sorted out.

3 Realizing a Society that Utilizes Geospatial Information in a Sophisticated Manner

In order to utilize location and spot information or “geospatial information ^{Note}” in a more sophisticated manner through ICT, initiatives are being promoted to realize a G Spatial Society (Sophisticated Utilization of Geospatial Information Society) where the necessary geospatial information can be utilized by anyone at anytime and anywhere in accordance with the Basic Plan for the Advancement of the Utilization of Geospatial Information, which was enacted by Cabinet Decision in March 2012.

Note Information that indicates the position of a specific point or area in geospace (including temporal information pertaining to said information) as well as any information associated with this information. Also called G-spatial information (Geospatial Information).

(1) Maintaining and Updating Geospatial Information as the Foundation of Society

The Digital Japan Basic Map ^{Note 1} and Fundamental Geospatial Data ^{Note 2}, which can be commonly used by the entire society as the basis for utilizing various geospatial information, is being rapidly developed and updated with the coordination of various administrative organizations. Various types of information regarding national land are being developed, such as aerial photographs, geographical name information, National Land Numerical Information, and continuous monitoring of crustal movements with GNSS-based control stations. In addition, the system is being constructed, enabling prompt assessment and provision of the information on national infrastructure, such as maintenance of information on the topographical classification used as the basic material for developing hazard maps prepared for future disasters, and urgent photography of aerial pictures during disasters.

(2) Initiatives to Promote the Utilization of Geospatial Information

Developed geospatial information is broadly provided via the Internet. Also, initiatives are being taken by industrial, academic, and government parties to further promote a geospatial information library that allows for the searching, browsing, and downloading of various types of information, as well as to improve GSI maps ^{Note 3}, thereby facilitating the layering of various types of information on the Web and further promote the sharing and mutual use of such information with society as a whole. In order to further disseminate such information among members of the public and generate new industries and services, we have been carrying out verification projects that are effectively used for disaster prevention and mitigation, the creation of local areas, and regional revitalization. In addition, G Spatial Expo 2015 was held in November 2015 through cooperation among industrial, academic, and government parties.

4 Realizing an Electronic Government

Following the “Declaration to be the World’s Most Advanced IT Nation”, various initiatives are being carried out to realize an electronic government. In particular, regarding the online usage, initiatives are being taken to improve convenience for citizens as well as making administrative operations simple and efficient, based on the reform policies to improve the convenience of online procedures.

Regarding automobile ownership procedures, a “One-Stop Service (OSS)” that allows for the execution of various procedures, –such as inspection, registration, automobile parking space certification, and payment of various vehicle taxes—online and at the same time, is being promoted through the cooperation of various ministries, and is currently being implemented for the new registration of brand new cars in 11 municipalities. Based on the “Basic Policy Regarding the Reform of Independent Administrative Institutions” approved by the Cabinet on December 24, 2013, initiatives are underway to realize nationwide deployment and increase the procedures handled by the OSS by the end of FY2017. A study of convenience improvement measures comprising the use of the My Number Card in automobile inspection registration procedures is being promoted in accordance with the 2015 revised version of the Japan Revitalization Strategy (Cabinet decision made June 2015) and Declaration to be the World’s Most Advanced IT Nation (Cabinet decision made June 2015).

5 Development and Opening of Optical Fiber for the Management of Public Facilities and Its Housing Space

The development and opening of optical fiber for the public facilities management and its housing space is being

Note 1 New electronically compiled maps that serve as our nation’s basic maps instead of the traditional paper maps including the 1:25,000 scale topographic maps. In addition to depicting our national territory appropriately, it serves as the most fundamental information of our national land’s conditions with geospatial information developed by the Geospatial Information Authority of Japan.

Note 2 Serves as the basis for the position determined for geospatial information on the digital map such as positional information for the geodetic control points, coastlines, boundaries of public facilities, and administrative boundaries. Criteria and standards are defined by ministerial ordinances of MLIT. The Geospatial Information Authority of Japan completed the preliminary development in FY2011, and it is currently being updated along with the Digital Japan Basic Map.

Note 3 Web maps operated by the Geospatial Information Authority of Japan (<http://maps.gsi.go.jp/>). More than 1,200 pieces of geospatial information have been distributed.

promoted in rivers, roads, ports, and sewage, as a response to the “e-Japan Priority Policy Program”. As of April 2015, the total extent of the optical fiber controlled by the government for river and road management was about 38,000 km, and of this a portion of core cable roughly 18,000 km that does not interfere with the facilities management was opened to private sector business, and in 2015 there were new applications for additional use of about 400 km.

6 Sophisticated Water Management and Water Disaster Prevention Utilizing ICT

In light of the new developments in information technology of recent years, new technology is being applied in the field to further the sophistication of water management and water disaster prevention.

Regarding the monitoring of rivers and their basins, XRAIN (MLIT X Band MP Radar Network), which allows for the near real-time observation of local rainfall, is being harnessed for rainfall observations. For the observation of flow amounts and water levels, the introduction and practical application of new technology, such as ADCP (Acoustic Doppler Current Profiler) and image analysis based on the utilization of CCTVs and other types of images, are being promoted. In ascertaining the extent of flooding during a disaster, emergency observations were made (Figure II-10-1-3, Diagram 1) with a satellite-based SAR system (Daichi No. 2) during the heavy rains that fell in the Kanto and Tohoku regions in September 2015. The use of big data, including SNS posts and various types of locational data, is being studied.

In addition to obtaining high precision topographic data through aerial laser profiling (LP), initiatives to improve the efficiency and effectiveness of maintenance and management by utilizing the image data obtained through Mobile Mapping Systems (MMS) are being promoted.

Further crisis management is being promoted by initiatives like flood simulation and risk understanding (Figure II-10-1-3 Diagram-2) based on “Distributed Rainfall-Runoff Model”, an advanced flood prediction model compared to the conventional one, that uses the information obtained through such rain volume, water level, and high precision topographic data.

Also, for sediment-related disasters caused by heavy rains and other factors, unusual conditions are always monitored through such means as a radar rain gauge that can observe the rainfall situation over a large area with a high degree of accuracy, volcano monitoring cameras, and landslide monitoring systems. Additionally, in preparation for the occurrence of a deep-seated catastrophic landslide, the development of the Deep-seated Catastrophic Landslide Monitoring and Warning System, which detects the location and scale of an occurrence at an early stage, is being promoted for rapid emergency restoration measures as well as the prevention and mitigation of damage through appropriate warnings and evacuations.

In the sewerage field, investigations to implement

Figure II-10-1-3

Example of ICT Utilized for Sophisticated Water Management and Flood Prevention

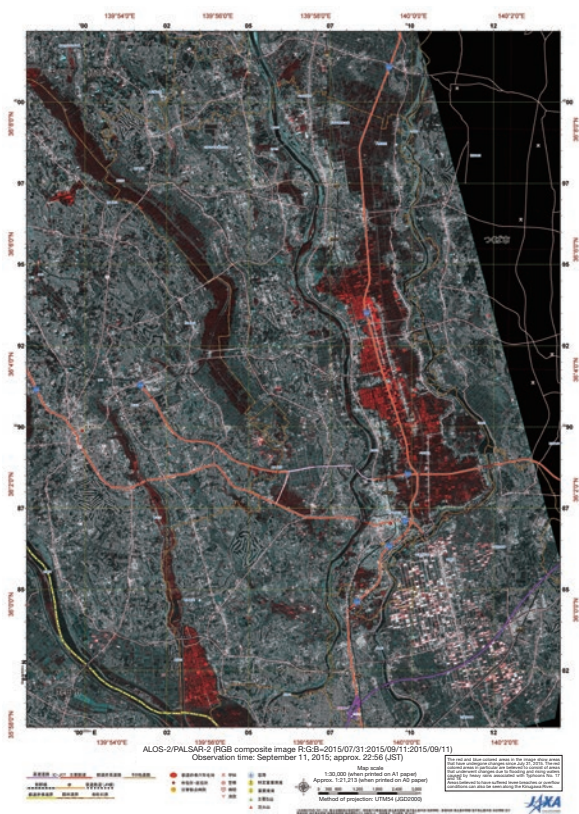


Diagram 1 Observational image captured by a SAR system during heavy rains that fell in the Kanto and Tohoku regions in September 2015 (near Joso City, Ibaraki Prefecture).

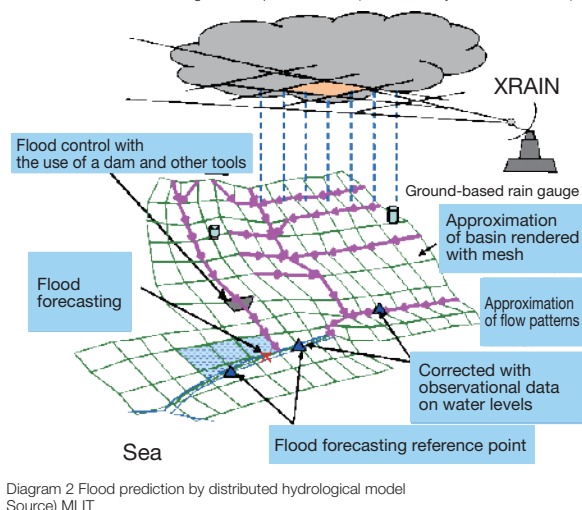


Diagram 2 Flood prediction by distributed hydrological model
Source) MLIT

improvements in terms of the sophistication and efficiency of site investigations by sensors, the efficient management of drainage through the consolidation of big data and analysis techniques, and precise facility operations based on the use of simulation technology and prediction techniques are being promoted.

7 Support for Innovations Benefitting Local Route Bus Businesses With the Use of Big Data

(1) Support for Innovations Benefitting Local Route Bus Businesses With the Use of Big Data

Thanks to a declining population, a dwindling birthrate, and an aging population, the business conditions of route bus businesses particularly in local regions are worsening and giving rise to concerns that public transportation networks will shrink and service levels will suffer further. The stabilization of the management of route bus businesses and the restructuring of sustainable local public transportation networks are pressing issues, such that management improvements by operators and plans for the reorganization of public transportation by local governments are being studied in many localities.

In response, we formulated in FY 2015 a business model for supporting innovations benefitting local route bus businesses based on the possibility of using big data and the methodology applicable to data analysis as studied through a survey on the ICT-based activation of public transportation carried out in FY 2014. Business innovations will be attempted by utilizing big data to conduct market surveys to ascertain the actual state of human mobility and the needs of residents and carry out management analyses to evaluate the state of income and expenditures tied to buses; reorganizing bus routes and schedules; planning management improvement measures; and undertaking implementation, evaluation, and review actions on an ongoing basis.

In verifying the practicability and effectiveness of a business model formulated upon implementing model projects for the city of Niigata and Niigata Kotsu Co., Ltd., which adopted BRT and reorganized their bus routes, as part of a study conducted in FY 2015, it was determined that the adoption and dissemination of this business model in different regions will be promoted based on the outcome of this process.

(2) Utilization of Automobile Related Information

In order to promote the dissemination of telematics insurance services according to the Future Vision on the Utilization of Automobile-Related Information as formulated in January 2015, verification results were shared and accident reduction effects were ascertained through the cooperation of insurance companies that have begun offering these services ahead of the rest of the industry. Verification and evaluation activities to determine whether close rates pertaining to the purchasing of pre-owned vehicles are a function of the existence of traceability data have been carried out to verify effects with a view to realizing traceability services that are based on the collection and use of vehicular history information. In this way, specific initiatives have been undertaken for the creation of new services and to promote industrial innovations through the use of automobile-related information. We will continue to study frameworks for evaluating the feasibility of introducing new services and for collecting, managing, and providing information for the purpose of realizing new services and otherwise proactively advance the development of an environment for promoting the utilizing of automobile-related information.

Section 2 Promoting the Research and Development of Technology

1 The Position of Technological Research and Development in Technology Policies and Comprehensive Promotion

In the “Japan Revitalization Strategy” as revised in 2015 (Cabinet decision, June 2015), one of the pillars of the revitalization plan for Japanese industry is the “*promotion of science, technology, and innovation*” and expectations for the role played by science, technology, and innovation are increasing as seen by the intent to vigorously promote the Comprehensive Strategy on Science, Technology, and Innovation 2015 (Cabinet decision, June 2015).

The MLIT takes into account the government’s overall policy, including the Science and Technology Basic Plan, to further improve the framework for coordination between industry, academia, and government, as well as the comprehensive promotion of cross-sectoral technological research and development, in accordance with the Third Ministry of Land,

Infrastructure, Transport and Tourism Technology Basic Plan and is actively adopting the resulting outcomes in public works, the construction and transport industries, and elsewhere.

(1) Initiatives in facilities and Other Organs, Extraordinary Organs, External Bureaus, and National Research and Development Agencies

Key initiatives undertaken by facilities and other organs, extraordinary organs, external bureaus, and national research and development agencies under the jurisdiction of MLIT are as outlined in the figure. National research and development agencies selectively and efficiently conduct research according to social and administrative needs for the purpose of securing maximum results from research and development for the sound growth of our national economy through improvements in the level of science and technology in Japan and other benefits.

Figure II-10-2-1 Major Initiatives for FY2015 by Facility Organizations, Special Organizations, and External Bureaus

Organizations, etc.	Summary
Geospatial Information Authority of Japan	Operating under the auspices of the Geography and Crustal Dynamics Research Center, the Geospatial Information Authority of Japan engages in research and development activities in order to realize a society that utilizes geospatial information in an advanced manner and to contribute to disaster-prevention and environmental objectives by Development of a system to monitor slip deficit rate and forward slip on plate boundaries based on wide-area crustal movement data, engaging in research on ionospheric correction technology for the sophisticated monitoring of crustal movements based on the use of satellite-based SAR interferometry, Efficient creation method of land vulnerability information for producing earthquake hazard maps, and Improvement of orthoimage productivity by full-automated aerial triangulation.
Policy Research Institute for Land, Infrastructure, Transport and Tourism	The Policy Research Institute for Land, Infrastructure, Transport and Tourism carries out surveys and research activities for the purpose of making broad contributions to the formulation of policies in the field of national land and transportation. In FY 2015, topics of research that was carried out include the following: organizational safety management methods of transport companies; use of big data for the administration of land, infrastructure, transport, and tourism; strategic public infrastructure maintenance and renewal through integrated partnerships among various players; and method for predicting the domestic visit area distribution of foreign tourists visiting Japan.
National Institute for Land and Infrastructure Management (NILIM)	The National Institute for Land and Infrastructure Management engages in research and development work with a primary focus on research concerning the maintenance of infrastructure, an area that includes methods for diagnosing the soundness of road structures, design methods pertaining to repairs and reinforcement work, and sewage inspections and deterioration diagnostic techniques; research concerning disaster prevention, disaster mitigation, and crisis management, an area that includes high-precision methods for predicting the occurrence of sediment-related disasters through the use of real-time observation and monitoring data, river embankment technology for prolonging the period prior to collapse as much as possible, and technology for improving safety while residents flee from a tsunami striking a port or harbor; research concerning the intelligent use of methods for quantitatively assessing technologies to facilitate the more effective use of roads through the use of ETC2.0 and technologies for incorporating energy-saving design into the varied skeletal structures of homes in an area; and research concerning innovations into work procedures, such as in terms of new approaches to the execution of a project through a public-private partnership.
Meteorological Research Institute	Conducted research on understanding the phenomena of weather, climate, earthquake volcanoes, and the ocean as well as predictions to contribute to "strengthening measures for typhoons and torrential rains", "strengthening measures for earthquake, volcano, and tsunami disasters", and "strengthening of measures related to climate change and global environment".
Japan Coast Guard	Conducted testing and research for equipment and materials used for Coast Guard duties, testing and research for forensic science at sea, and advancing observation technology for seafloor crustal movements.

Figure II-10-2-2 Key initiatives undertaken by national research and development agencies under the jurisdiction of MLIT in FY 2015

National research and development agency	Summary
Public Works Research Institute*	Conducted research and development to contribute to the efficient creation of quality social capital and the development of Hokkaido such as "Research on prevention, mitigation, and early recovery from more intensified and diverse natural disasters", "Research on strategic maintenance and management of social capital stocks, and "Research on innovative technology for greener social infrastructure".
Building Research Institute*	Conducted research and development on technologies related to housing, building, and urban planning such as "Research and development related to the promotion of low-carbon housing, building, and cities", and "Research and development on technology to improve the safety of buildings against earthquakes, etc."
National Traffic Safety and Environment Laboratory	Conducted test research related to the safety assurance of land transport and environment preservation, technical standards conformity assessment of automobiles, and technical evaluations related to recalls, including "Promoting the development and commercialization of next generation heavy vehicles" and "Survey on the requirement for communication between a pedestrian and a vehicle."
National Maritime Research Institute*	Conducted research on ensuring the safety of marine transport, preservation of marine environment, marine development and advanced marine transport including, "Research for advanced analysis technology for high precision reproduction of marine accident occurrence conditions", "Research on green evolution of ships that contribute to revolutionary technology to reduce the environmental burden", and "Research on advancing and developing a safety evaluation method on renewable marine energy production systems".
Port and Airport Research Institute*	Conducted research and development to contribute to the formation of a safe and secure society, the maintenance and creation of excellent environment in coastal areas, and the creation of an energetic economic society including "Research on community protection from large scale earthquake and tsunami", "conservation and recovery of ecological system along coastal areas and CO ₂ absorption, and "Environmental improvement of enclosed coastal seas", and "Research on strategic maintenance and management of ports and harbors and airport facilities".
Electronic Navigation Research Institute*	Implemented research and development for advancing air traffic management systems such as "Expanding the capacity of airways", "Expanding the processing capacity of congested airports", and "Safety and technology that connects air and land".

*National research and development agency

(2) Initiatives of Regional Development Bureaus

Technical and Engineering Offices as well as Port and Airport Technology Investigation Offices coordinate with relevant offices in their jurisdiction for tests and research of civil works material and water quality, hydraulic tests and design for the effective and efficient development of facilities, development of environmental monitoring systems, and other matters for technology development, as well as the utilization and promotion of new technology tailored to the region.

(3) Promoting research and development technologies of construction, traffic and transportation fields

Of the important research issues concerning construction technology, issues that are especially urgent and involve a wide range of fields are taken up with the governmental departments taking the lead with the coordination of industry, academia and government to comprehensively and organizationally implement research for the “comprehensive technology development projects” where in FY2015, research and development was conducted for a total of five issues including the “Development of function continuity technology for the disaster site buildings.”

Also, for the traffic and transportation fields, technological research and development that contributes to ensuring safety, improving convenience, and protecting the environment are being promoted efficiently and effectively with the coordination of industry, academia and government. In FY 2015, we engaged in the development of technology that could be used for upgrading public transportation systems utilizing high-precision positioning technology.

(4) Supporting Private Sector Technological Research and Development

To promote private sector investments in research and development, support is given through preferential tax measures for experimental and research expenses.

(5) Promoting Open-Type Research and Development

In order to promote technological innovation in the construction sector, an open call for the development of technologies to solve policy issues (targeted commercialization in two to three years) was made through the Construction Technology Research and Development Subsidy Program, which invites proposals concerning technological research and development to help upgrade and enhance the international competitiveness of construction technology under the purview of MLIT and further promote research and development carried out by MLIT. In FY 2015, nine new issues and six ongoing issues were adopted.

In FY 2015, an open call for research issues on five research themes—including anti-aging measures of disaster prevention and mitigation measures, and appropriate maintenance and renewal of transport infrastructure—was made through the Transportation Technology Development Promotion System, which selectively carries out at a national governmental level basic research truly needed for resolving policy issues identified in the MLIT basic plan on technology. Three new issues and six ongoing issues were accordingly adopted.

2 Promoting the Utilization and Adoption of New Technology for Public Works

(1) New Technology Utilization System for Public Works

In order to actively utilize promising new technology developed by private sector businesses, a “new technology utilization system for public works” that utilizes the New Technology Information System (NETIS) is under operation. Up to now, there were 23 recommended technologies and 53 runner-up recommended technologies chosen as innovative new technologies that will further raise the level of technology concerning public works. Also, to promote efficiency of maintenance and management in the field, for the adoption of new technology in the field and the promotion of further technological development, NETIS is leveraged to set technical themes to use and evaluate the submitted technologies in the field.

(2) Supporting the Utilization of New Technology

In order to promote the utilization of new technology in public works and other areas, utilization is evaluated at every design stage, and technology that provides great utilization benefits are designated by the ordering party when construction is contracted. With respect to new technologies whose use is being proactively considered by ordering offices, a provisional

unit price that helps with streamlining the contracting process was created for seven technologies from FY 2012 to FY 2015.

Section 3 Improving Construction Management Technology

1 Improving Costing Technology for Public Works

For the purpose of ensuring the transparency of public works, various price data standards are made public. In FY 2015, i-Construction, a method of improving productivity by incorporating ICT into studies, surveys, design functions, construction work, inspections, maintenance functions, and updating processes, was promoted and new estimation standards for ICT construction were enacted.

In addition to the promotion of i-Construction, estimation standards have been revised to facilitate the realization of attractive construction sites made possible by increasing the productivity of all construction site processes through the reinforcement of standards based on the cultivation of the maintenance sector, to be achieved in part by reviewing new bridge preservation work and methods of estimating maintenance work costs, and on amendments to laws on the verification of quality, to be achieved in part by reviewing enhancements to major metropolitan correction functions and the approach to the posting of accounts taken by transportation guidance and security personnel.

In addition, the standard percentages for civil engineering work were revised. In FY 2015, an expansion of construction categories subject to percentages for maintenance and repairs and corresponding percentage revisions as well as percentage revisions reflecting improvements in construction efficiency based on the latest in construction conditions were carried out to accommodate the aging of societal infrastructure.

Also, for construction machinery depreciation costs, field studies were carried out for the construction machinery owned by the contractors and the base value, maintenance and management costs, and operation costs were assessed and revisions are being implemented.

2 CIM and BIM Initiatives

Construction Information Modeling/Management (CIM) endeavors to seamlessly connect processes at all stages by linking and developing three-dimensional models from the survey, planning, and design stages to the construction and maintenance management stages and promoting the sharing of information among concerned parties involved in the entire project. With trial operations having begun in FY 2012, studies on adopting and promoting CIM were carried out in FY 2015 in both systemic and technical terms through collaborative efforts on the part of industrial, academic, and governmental players.

Since FY 2010, the adoption of Building Information Modeling (BIM) to help visualize design content and integrate and consolidate building information has been subject to trial operations to verify the effect of the adoption of BIM and any issues that might consequently arise. In addition, Guidelines on the Development and Use of BIM Models in Government Building Projects, which outline the basic principles and considerations to be taken into account when using BIM for government building projects, were compiled in March 2014. Since FY 2014, a track record of cases involving BIM introduction to which the guidelines were applied has been maintained.

Section 4 Technology Development for Construction Machinery and Mechanical Equipment

(1) Development and Supply of Construction Machinery

In order to carry out the appropriate maintenance and management of rivers and roads managed by the national government and respond quickly to disaster recovery, initiatives are being carried out across the nation to implement machinery for maintenance and management, as well as machinery for disaster measures. In FY 2015, an extra forty-one machines were added and 279 aging machines were updated.

Furthermore, in order to improve efficiency, conservation of labor, and safety of construction associated flood control projects and road development projects, studies as well as research and development for construction machinery and construction processes are being undertaken.

(2) Streamlining and Improving the Reliability of the Maintenance and Management of Machinery

For the protection of citizens' lives and properties from disasters, the construction of floodgate facilities, storage and drainage pump facilities, and road drainage facilities were furthered, starting around late 1965, and many of the facilities are becoming decrepit. As such mechanical equipment is required to function reliably during floods, the Technical Standards Applicable to Dams and Flood Gates Facilities (Draft) was revised and the Procedures for Inspecting and Developing River Gates and River Pump Systems (Draft) were newly formulated.

(3) Utilizing the Accomplishments of Construction Technology Development

In order to safely and swiftly carry out restoration activity at disaster sites where the danger of secondary disasters such as large-scale floods, sediment-related disasters, and slope collapses are high, a hydraulic shovel that can be remotely controlled, dismantled, and airlifted was developed. Eleven units have been deployed nationwide and shovels have been dispatched for disaster-recovery efforts.

(4) Promotion of Development and Introduction of Robots for the Next Generation Social Infrastructure

The social infrastructure of Japan is facing problems such as progression of aging, rise in the disaster risks of earthquake, storm and flood damage. Therefore, for the "5 emphasis fields" (Maintenance and management: Bridge, Tunnel, and Water; Disaster Response: Investigation and Emergency Restoration) that require the development and introduction of robots, initiatives are underway for the maintenance and management of the social infrastructure and improvement of effect and efficiency during disaster, by planning for the development and introduction of highly useful robots. In FY 2015, we made a public appeal to private companies and universities for robots capable of addressing our five

priority fields with a view to their experimental introduction beginning in the next fiscal year. Testing and evaluations at sites under our direct authority were conducted for eighty submitted technologies under the supervision of the Committee for Field Investigations on Next-Generation Social-Infrastructure Robots, and the results of this process were subsequently released to the public.

