

Basic information on road maintenance

October, 2025

Cabinet Office Okinawa General Bureau
Development and Construction Dept.
Planning Coordination Officer
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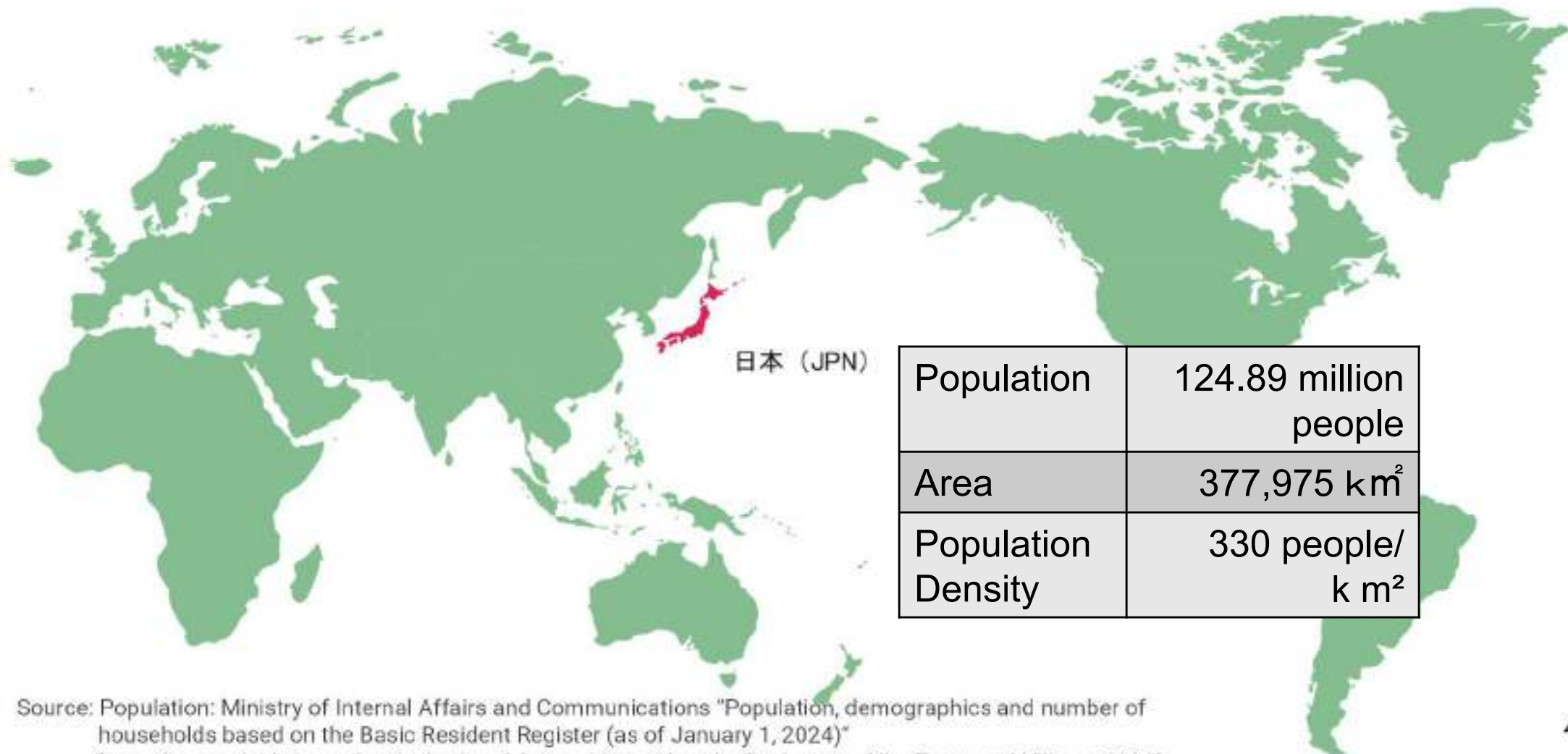
1. Overview of Japan
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4. Policies Concerning Road in Japan
5. Initiatives of Road Construction in Okinawa

1. Overview of Japan

(1) Overview of Japan

(2) Administrative organization of Japan

Japan is an island nation situated to the east of continental Asia, consisting of about 7,000 islands.



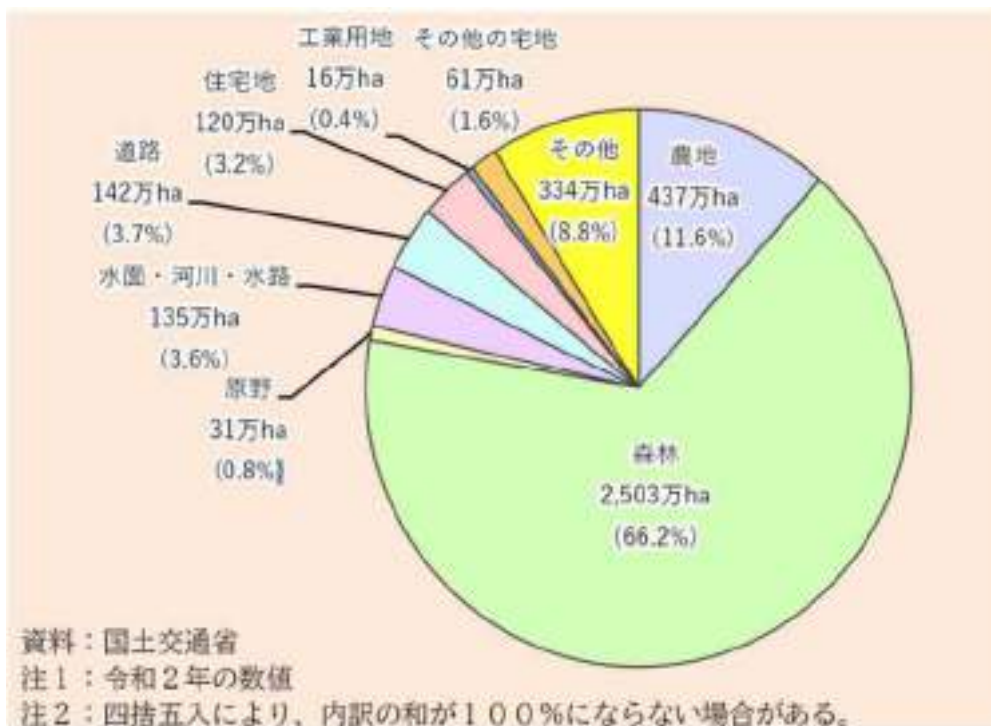
Source: Population: Ministry of Internal Affairs and Communications "Population, demographics and number of households based on the Basic Resident Register (as of January 1, 2024)"

Area: Geospatial Information Authority of Japan, "Area Chart by Prefecture, City, Town and Village, 2024"

Overview of Japan (Terrain)

Japan has an area of about 380,000km². About 70% of this is mountainous terrain. In addition, with about 66.2% forest and 11.6% farmland, the ratio of inhabitable land is small.

State of National Land Use (2020)

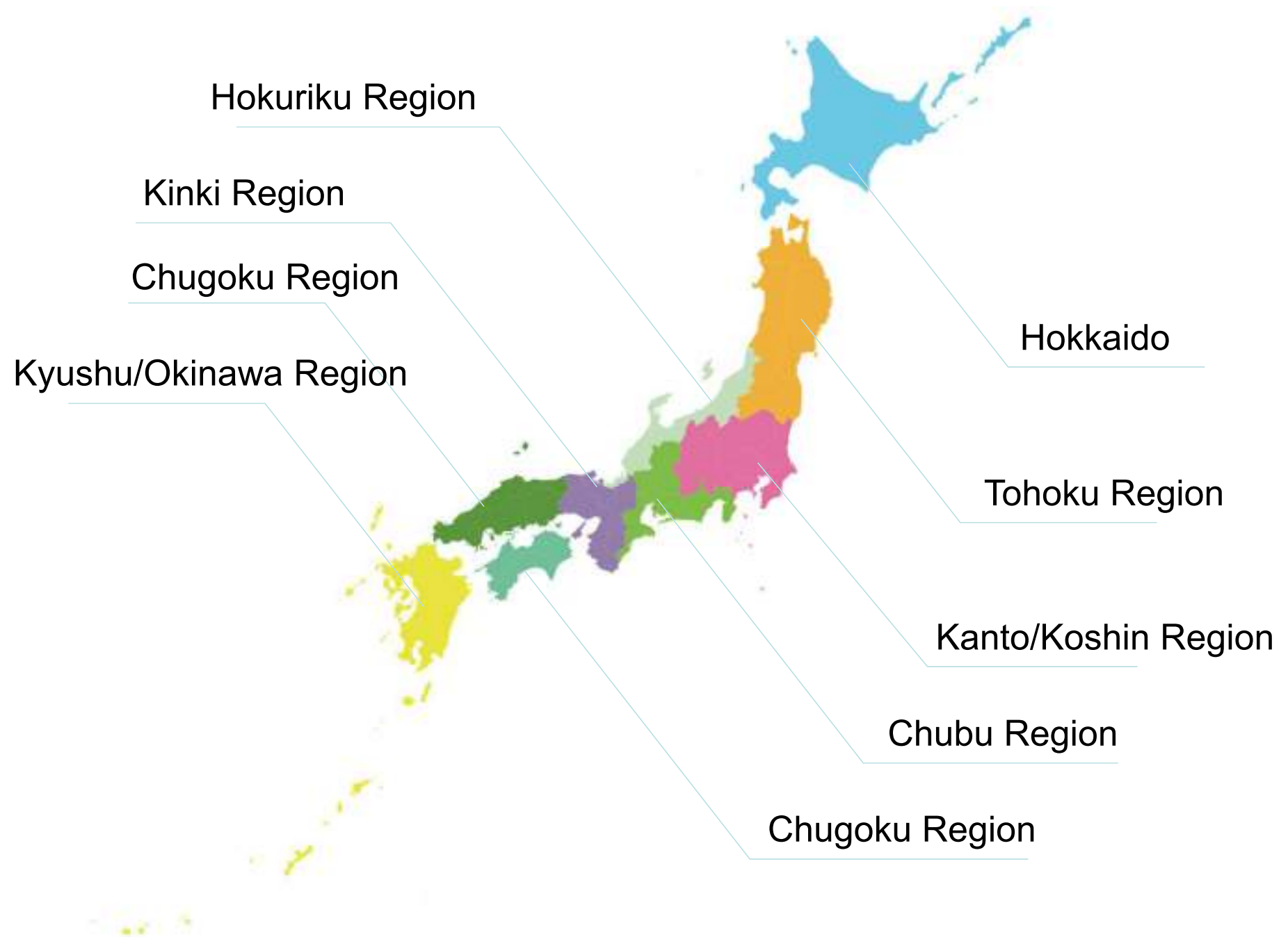


Source: MLIT "Land White Paper"]



Source: Geospatial Information Authority of Japan 「Geospatial Information Authority of Japan Map」

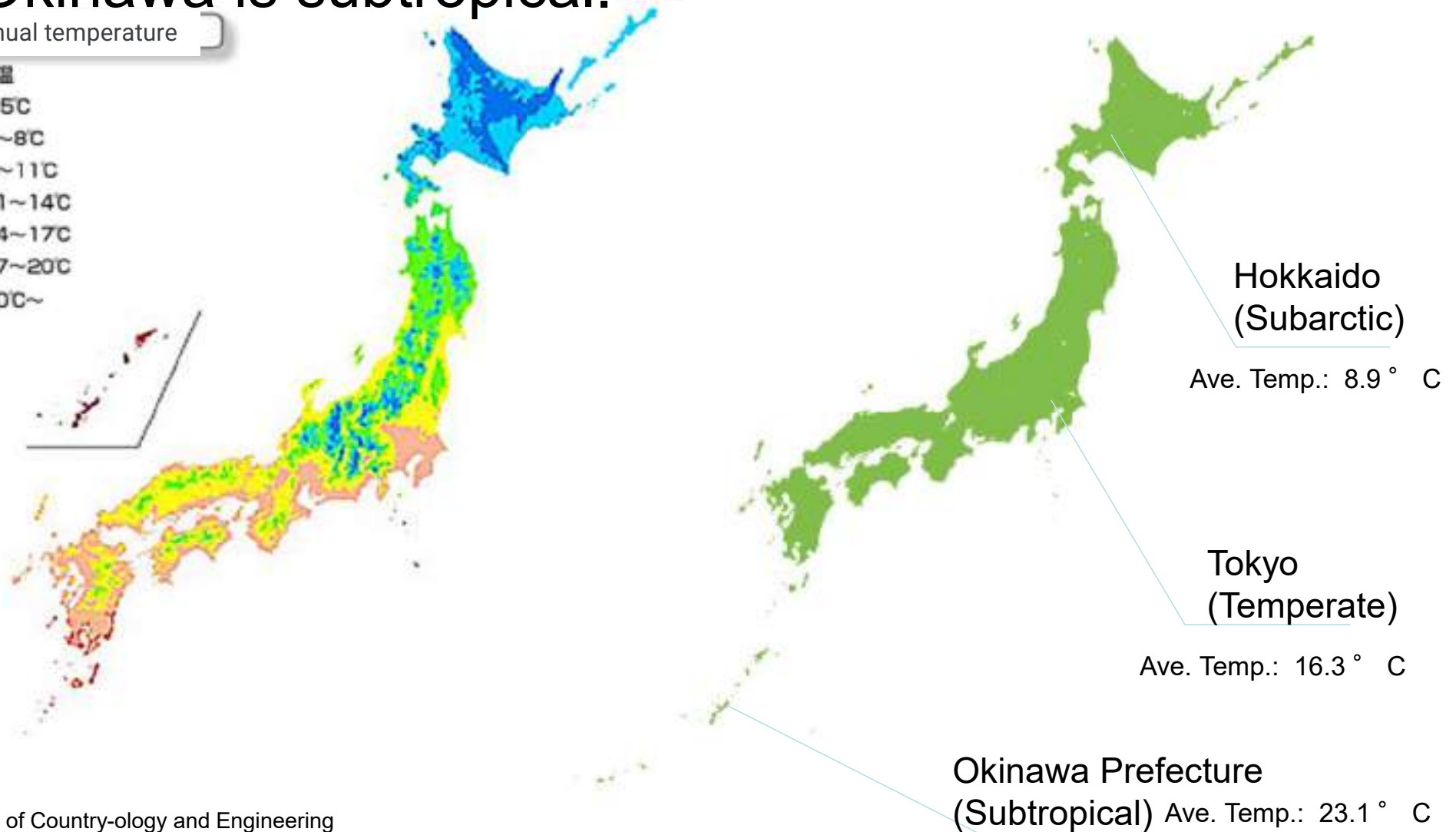
Overview of Japan (Regional division)



The land extends broadly from south to north, with most regions in the temperate zone, while Hokkaido is subarctic and Okinawa is subtropical.

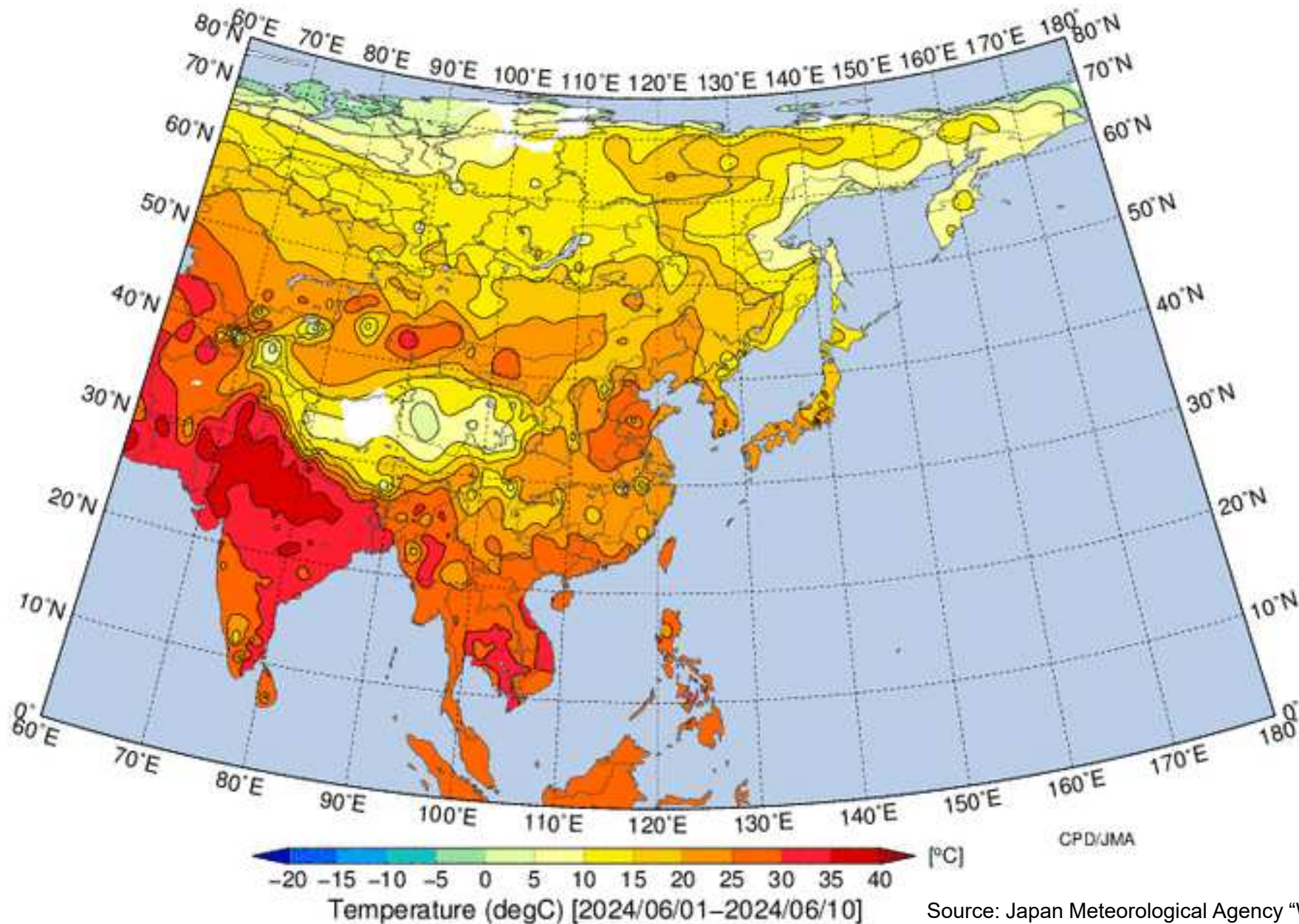
Average annual temperature

年平均気温



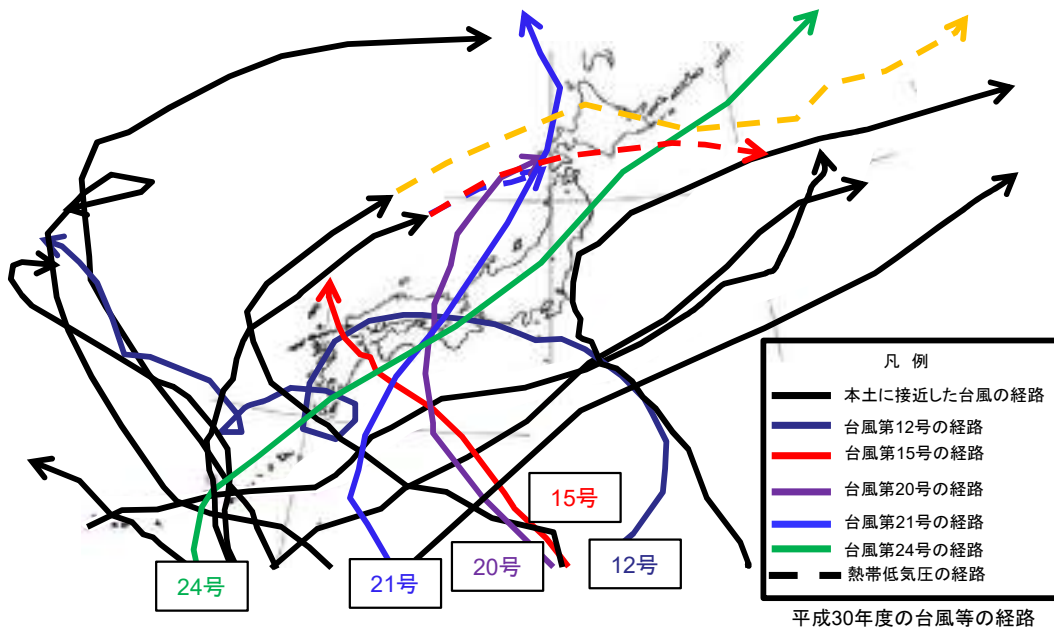
Overview of Japan (Climate Comparison)

The temperature is about 10°C~15°C cooler than other Asian countries.



- Average about 25.1 typhoons occur annually, with 3.0 landing in Japan.
- The number of annual rainfalls of 50 mm / h or more increases, and there is a high risk of disasters caused by typhoons and heavy rains.

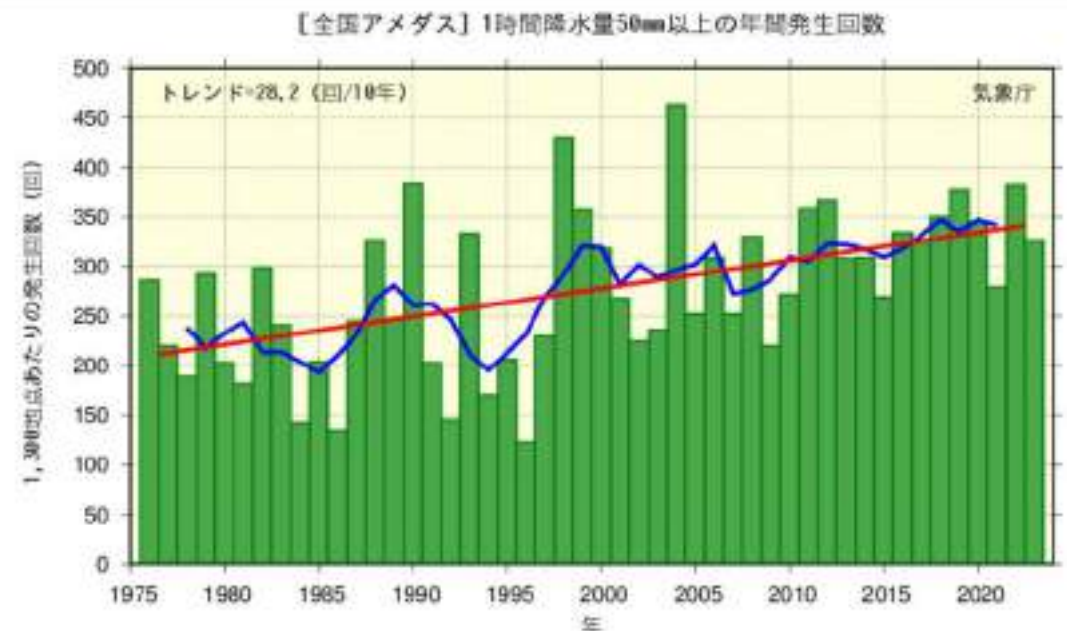
【Number of typhoons occurring, approaching, and making landfall (mainland Japan)】



台風の平均値(1991年～2020年の30年の平均値)

- Number of occurrences: Average 25.1 per year (28 in FY2018)
- Number approaching the mainland: Annual average 11.7 (10 in FY 2018)
- Number of landfalls: Average 3.0 per year (5 in FY2018)

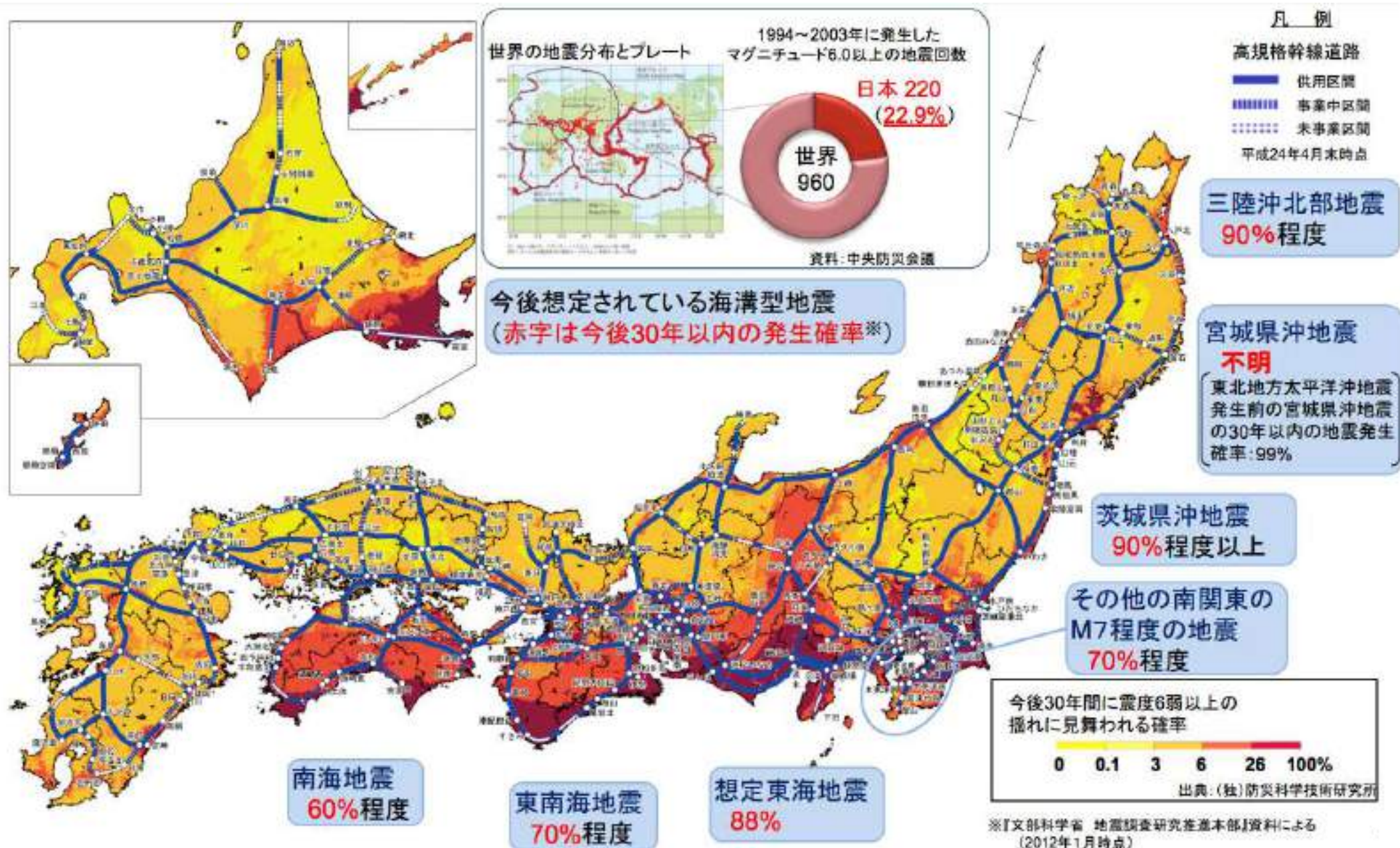
【Annual number of short duration heavy rainfall events of 50 mm/h or more】



The broken line (blue) shows the 5-year moving average and the straight line (red) shows the long-term change trend (average change trend over this period).

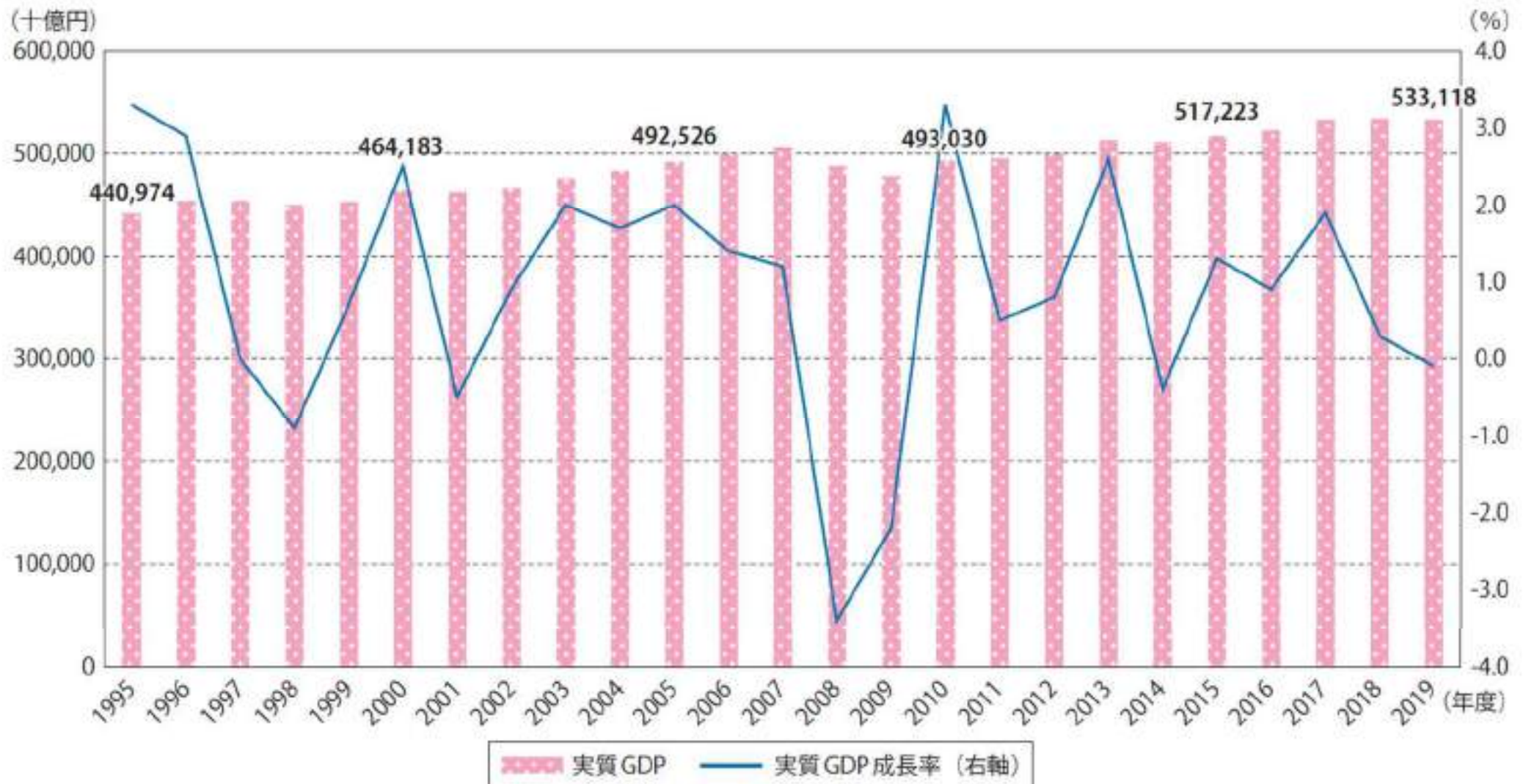
- The average annual frequency of rainfall events of 50 mm or less per hour nationwide in the last 10 years (2013-2022) (about 328 events) is about 1.5 times higher than the average annual frequency of rainfall events in the first 10 years of the statistical period (1976-1985) (about 226 events).

An earthquake-prone country with 20% of the world's large earthquakes, it is assumed that large-scale earthquakes will continue to occur in the future.



Japan's real GDP remains at about 500 trillion yen.

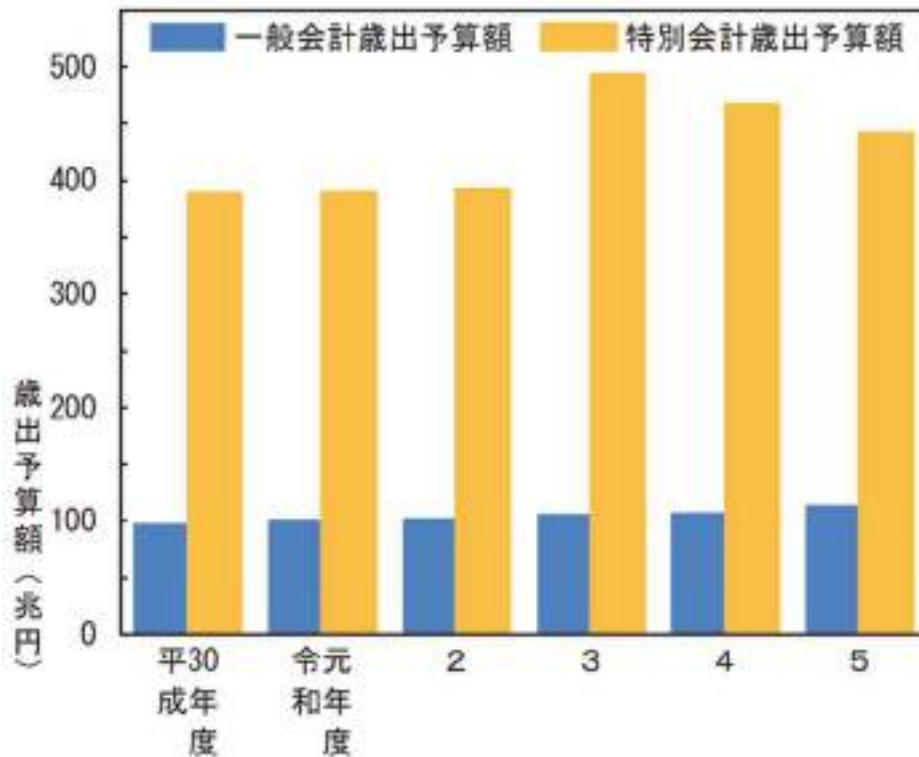
Changes in Japan's GDP



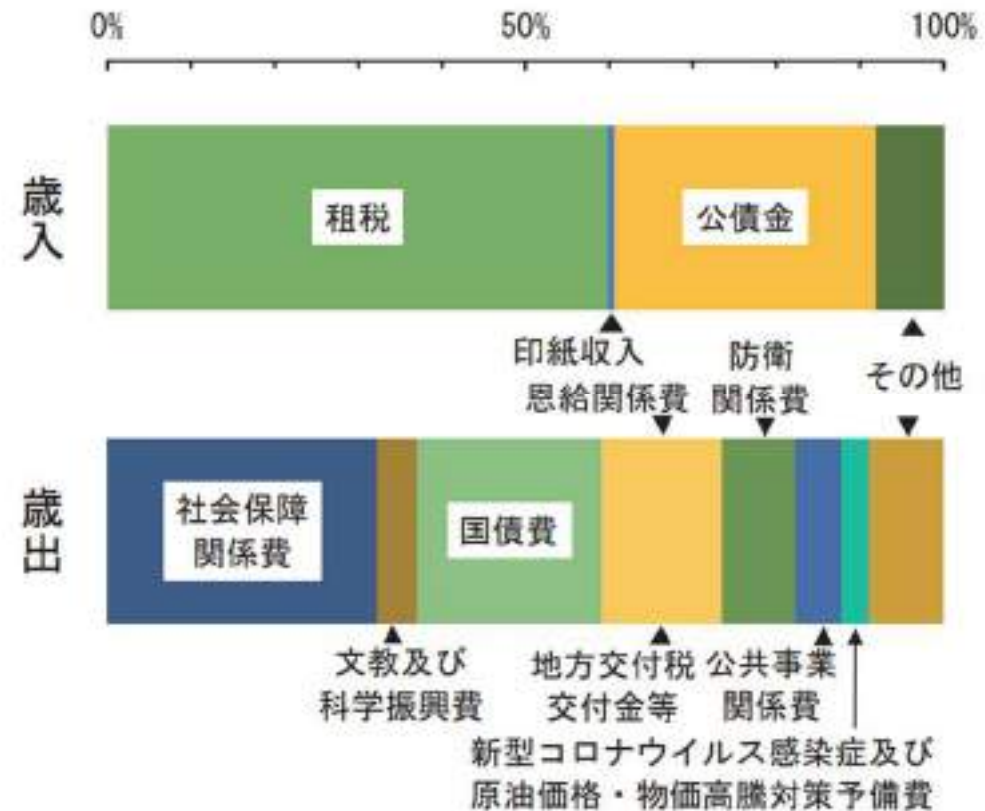
資料) 内閣府「2020年1—3月期四半期別GDP速報 (1次速報値)」より国土交通省作成

Japan's budget is about 500 trillion yen, including the general and special accounts. Expenditure on social security related costs are tending to increase.

○ General Account, Special Account
Expenditure Budget



○ Composition of General Account Revenue and
Expenditure Budget Amounts (FY2022)



Source: Ministry of Internal Affairs and Communications Statistics Bureau
"Japan Statistics 2023"

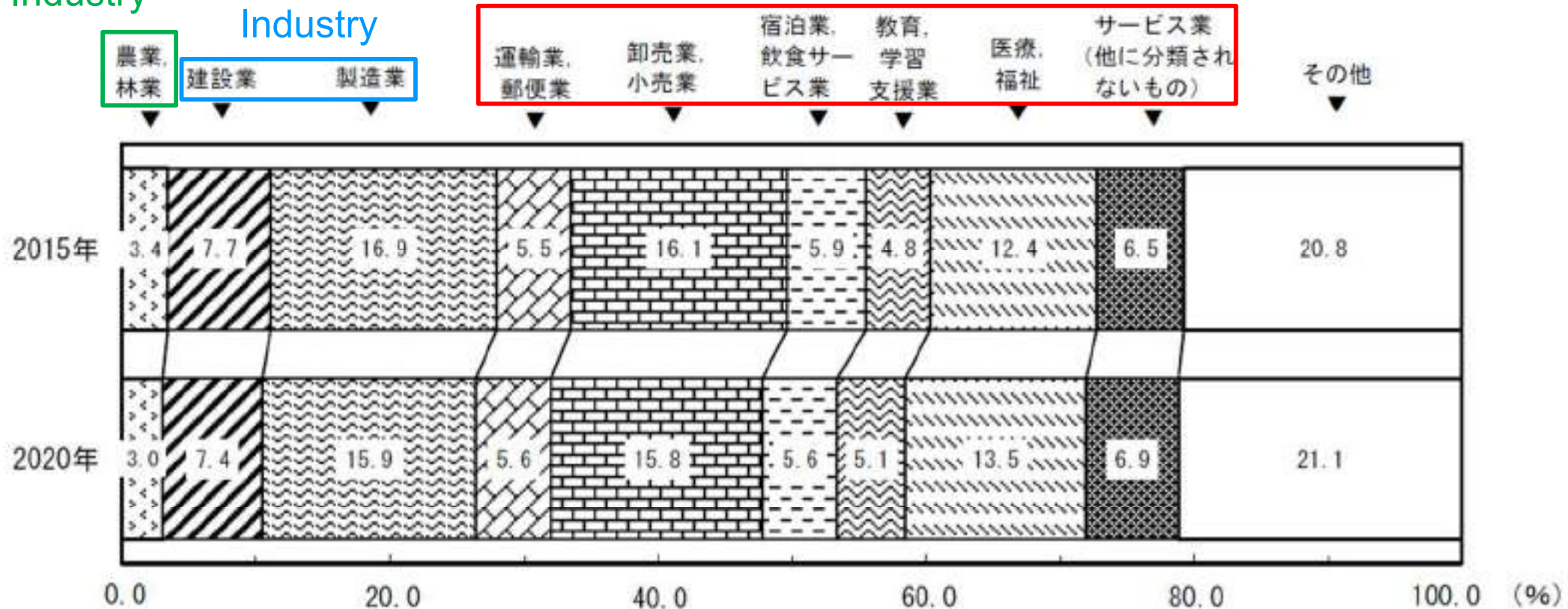
The industrial structure includes a high proportion of tertiary industries, service industries and medical welfare are trending up in the industry composition ratio.

Changes in composition by industry (nationwide)

Primary
Industry

Secondary
Industry

Tertiary Industry

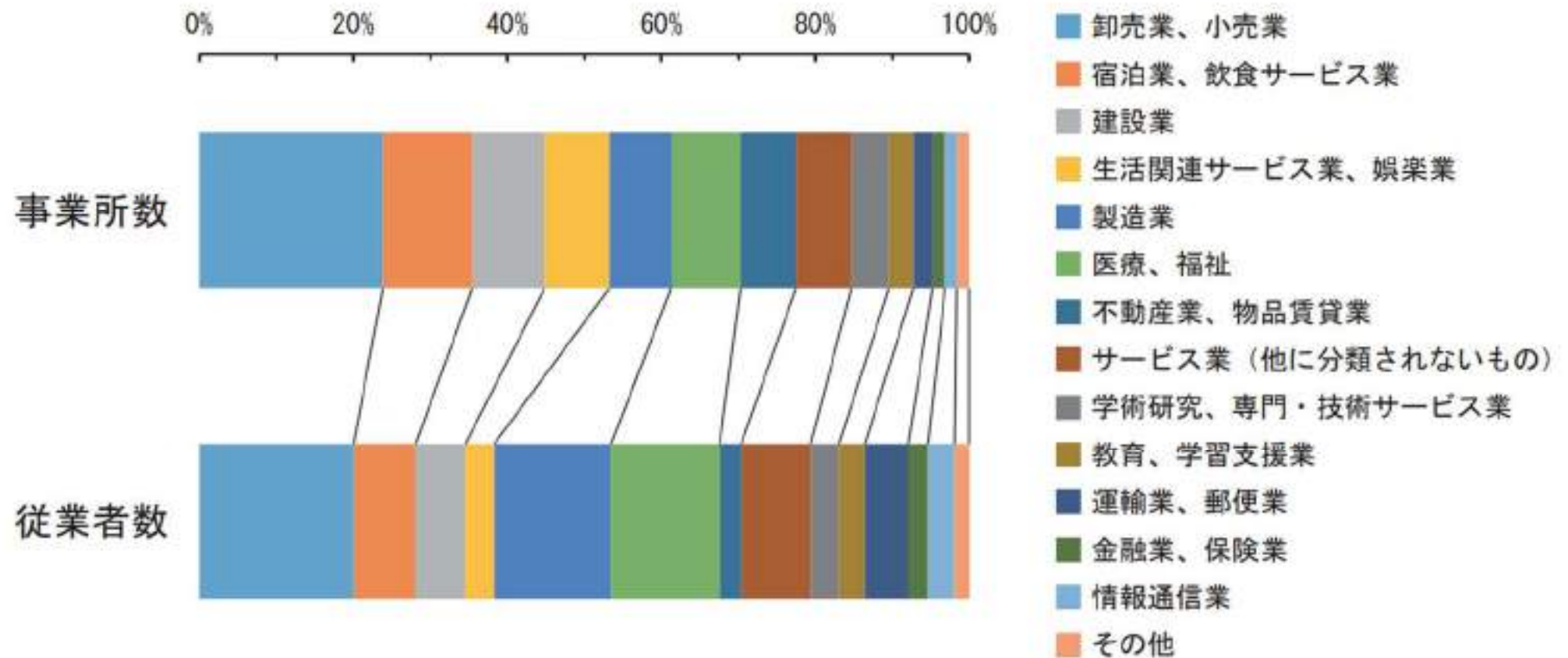


注) 不詳補完値による。

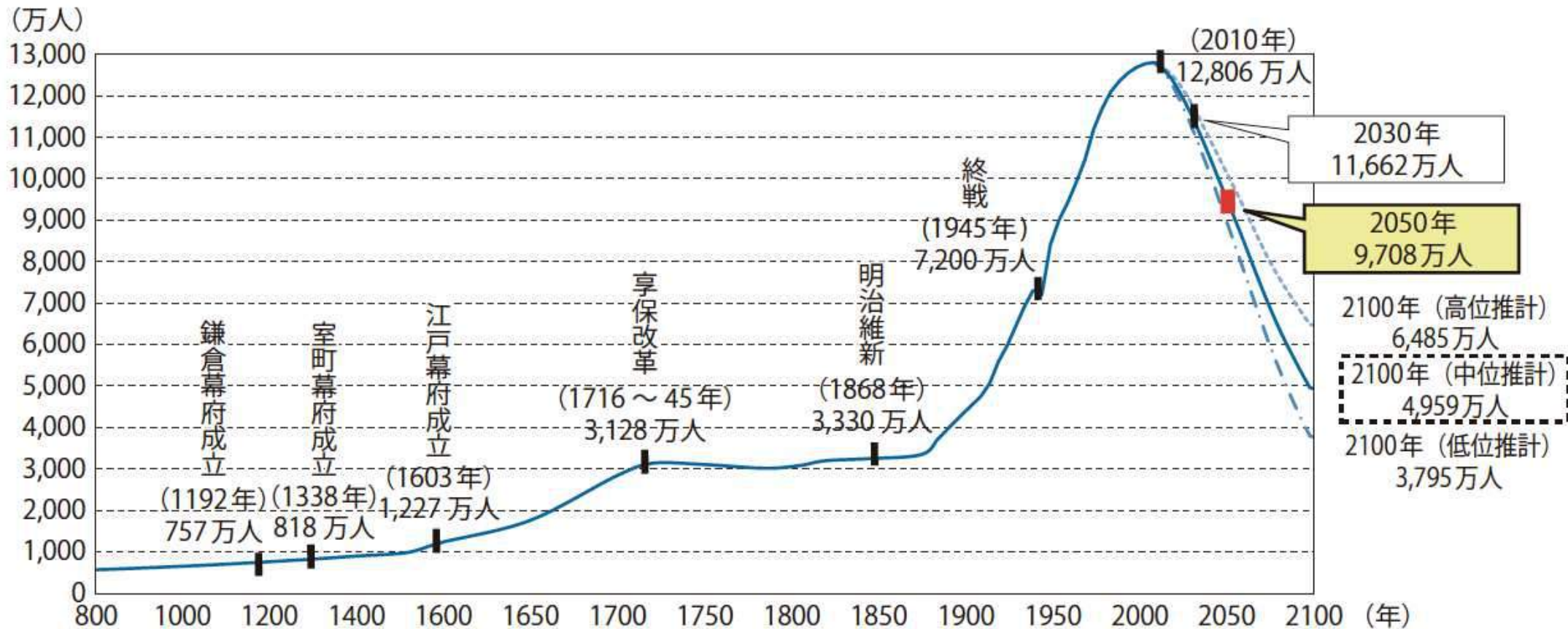
「その他」に含まれるのは、「漁業」、「鉱業、採石業、砂利採取業」、「電気・ガス・熱供給・水道業」、「情報通信業」、「金融業、保険業」、「不動産業、物品賃貸業」、「学術研究、専門・技術サービス業」、「生活関連サービス業、娯楽業」、「複合サービス事業」及び「公務（他に分類されるものを除く）」である。

The proportion of total businesses in wholesale and retail is high at 24%, and the number of employees are highest in wholesale, followed by retail and manufacturing.

○Proportions of Private Companies and Employees by Industry (2021)



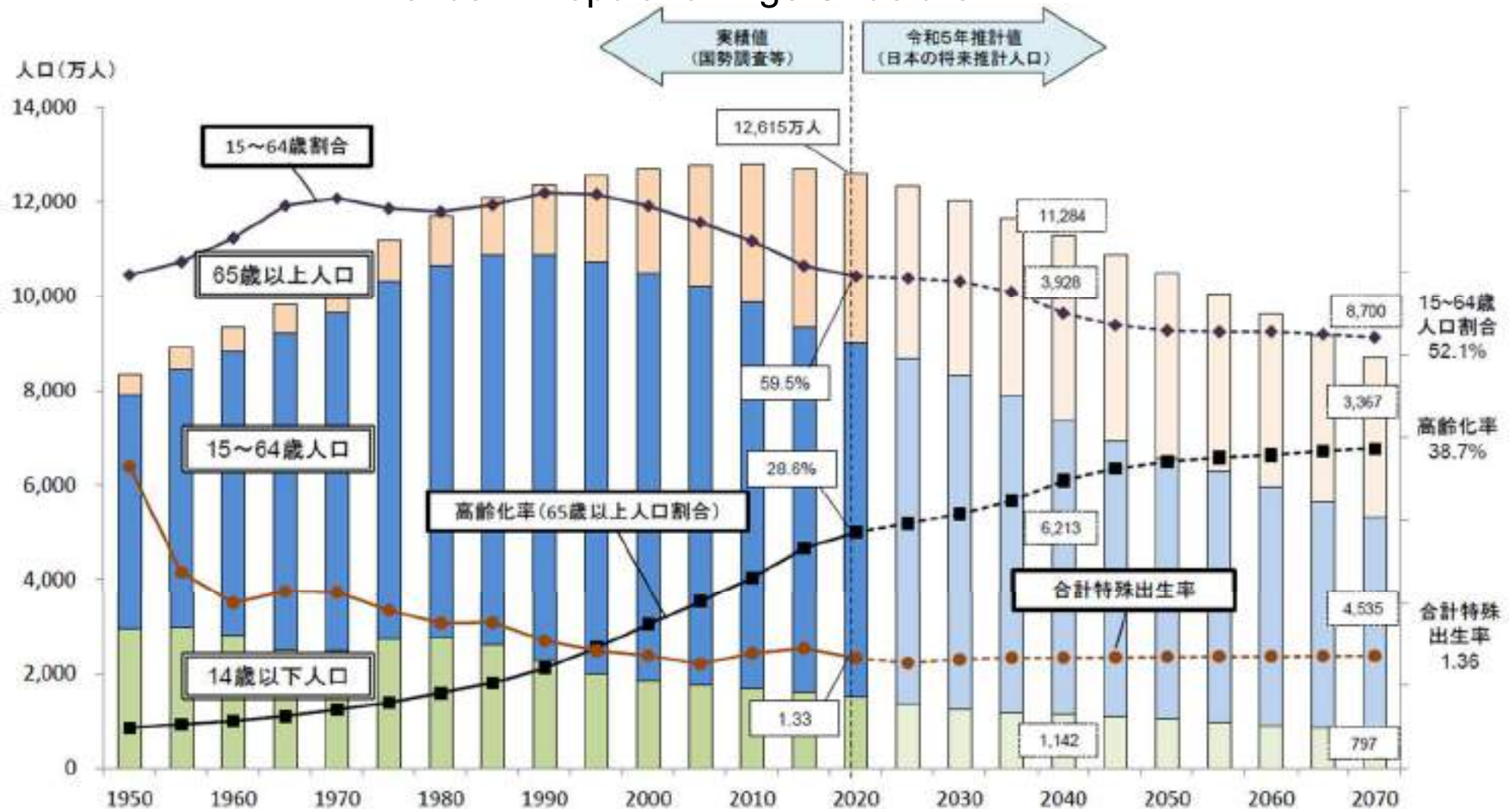
From its peak in 2005, the population of Japan has been in decline, and by 2050 it is expected to be about 30 million people less than current levels.



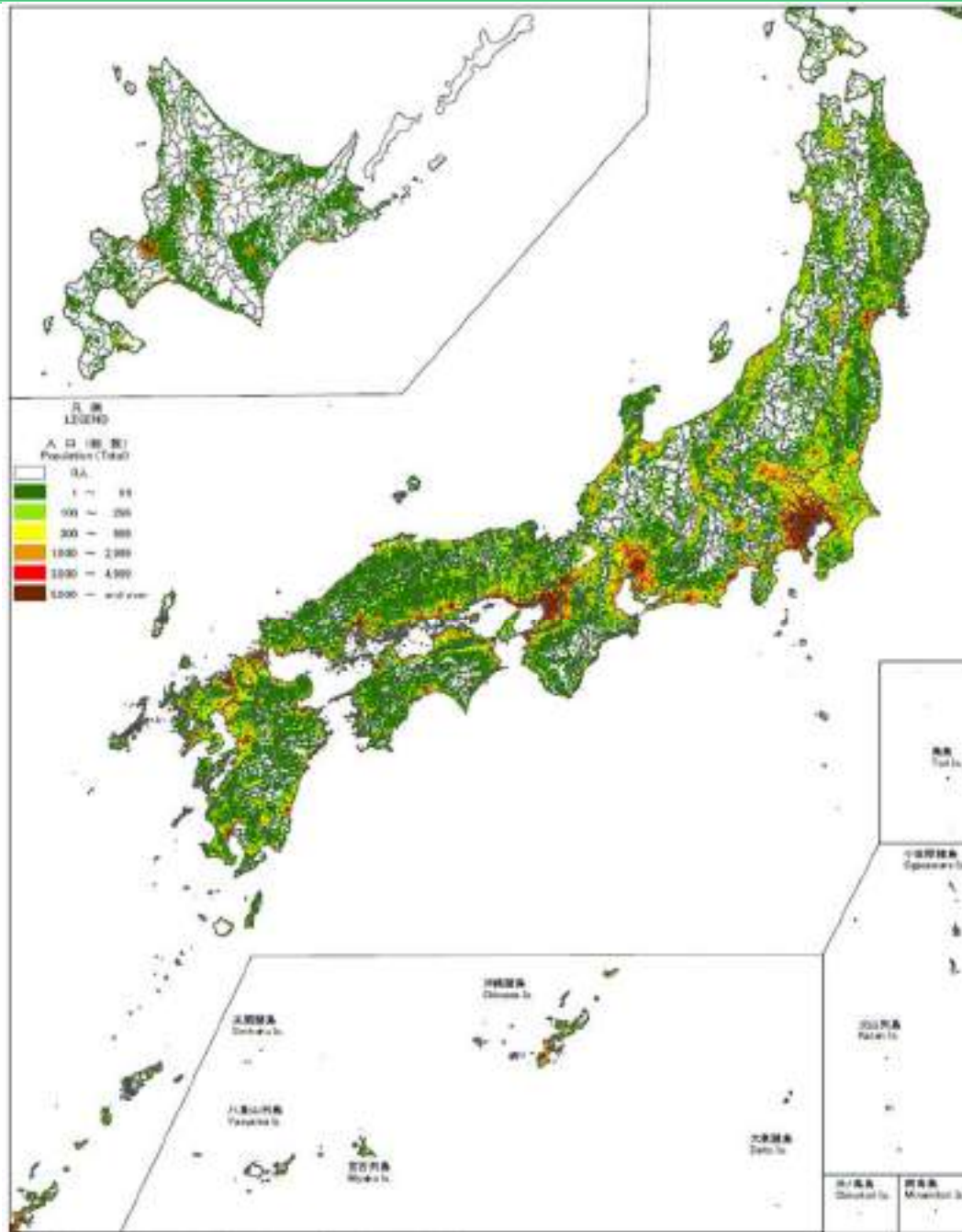
資料) 2010年以前は総務省「国勢調査」、同「平成22年国勢調査人口等基本集計」、国土庁「日本列島における人口分布の長期時系列分析」(1974年)、2015年以降は国立社会保障・人口問題研究所「日本の将来推計人口(平成24年1月推計)」より国土交通省作成

The proportion of the population aged 65 or older is increasing, and the working age population is decreasing.

Trends in Population Age Structure



(出所) 2020年までの人口は総務省「国勢調査」、合計特殊出生率は厚生労働省「人口動態統計」、
2025年以降は国立社会保障・人口問題研究所「日本の将来推計人口(令和5年推計)」「(出生中位(死亡中位)推計)」



The distribution of Japan's population is centered around the major metropolitan areas of the Kanto, Chukyo and Kinki regions.

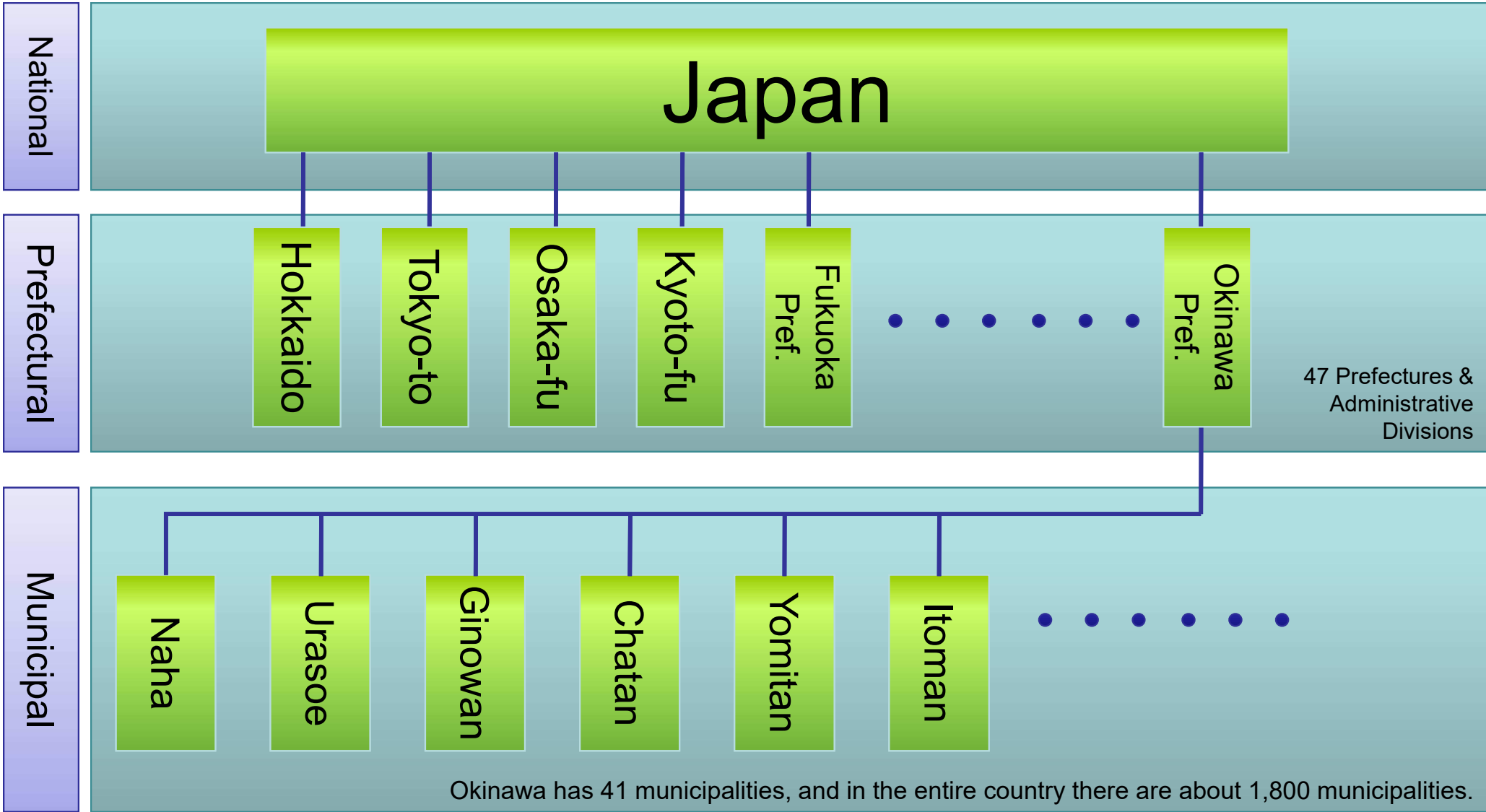
Population accumulation can also be observed around the designated cities of Sapporo, Sendai, Niigata, Shizuoka/Hamamatsu, Okayama, Hiroshima and Kyushu/Fukuoka.

1. Overview of Japan

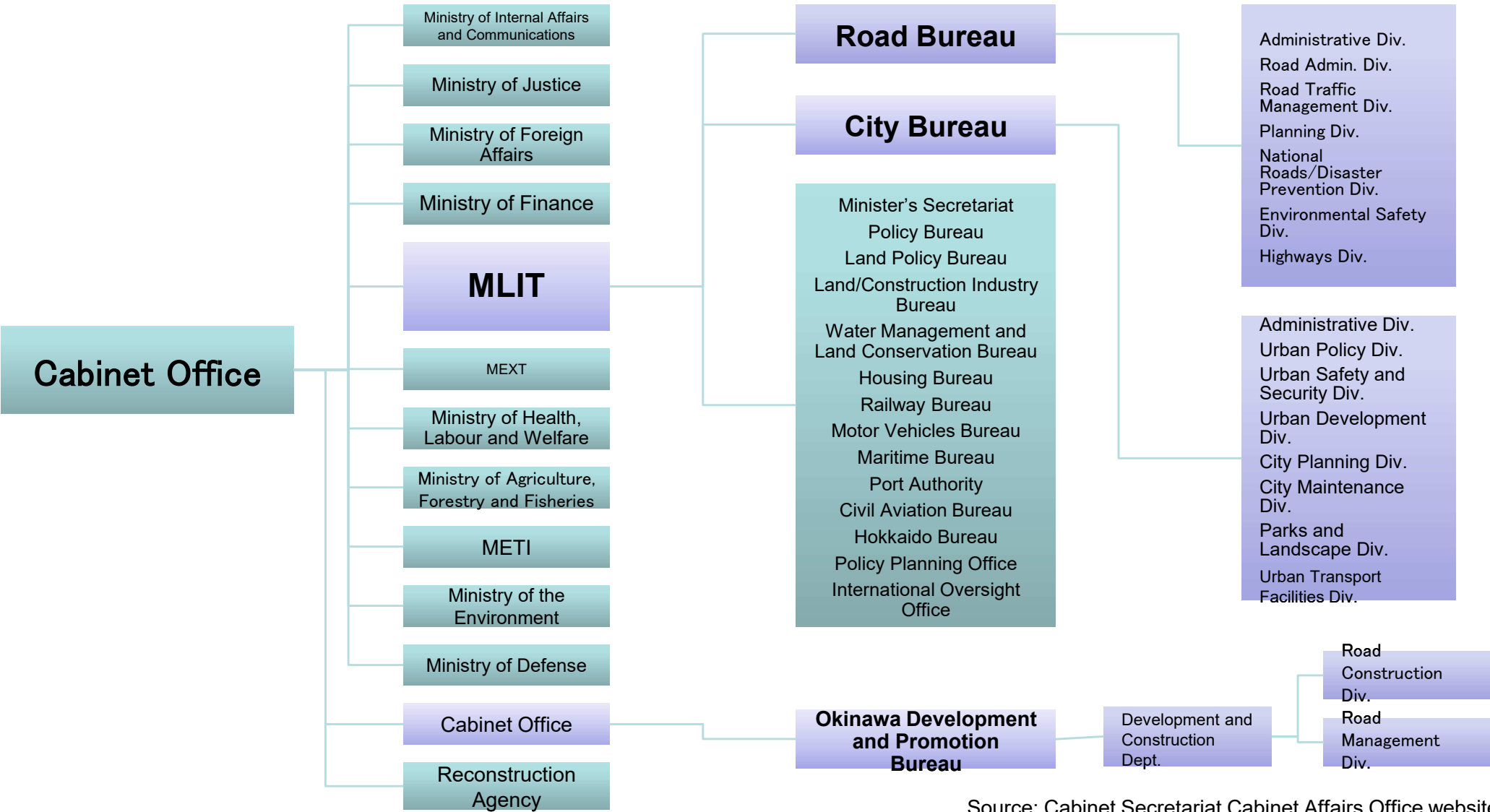
(1) Overview of Japan

(2) Administrative Organization of Japan

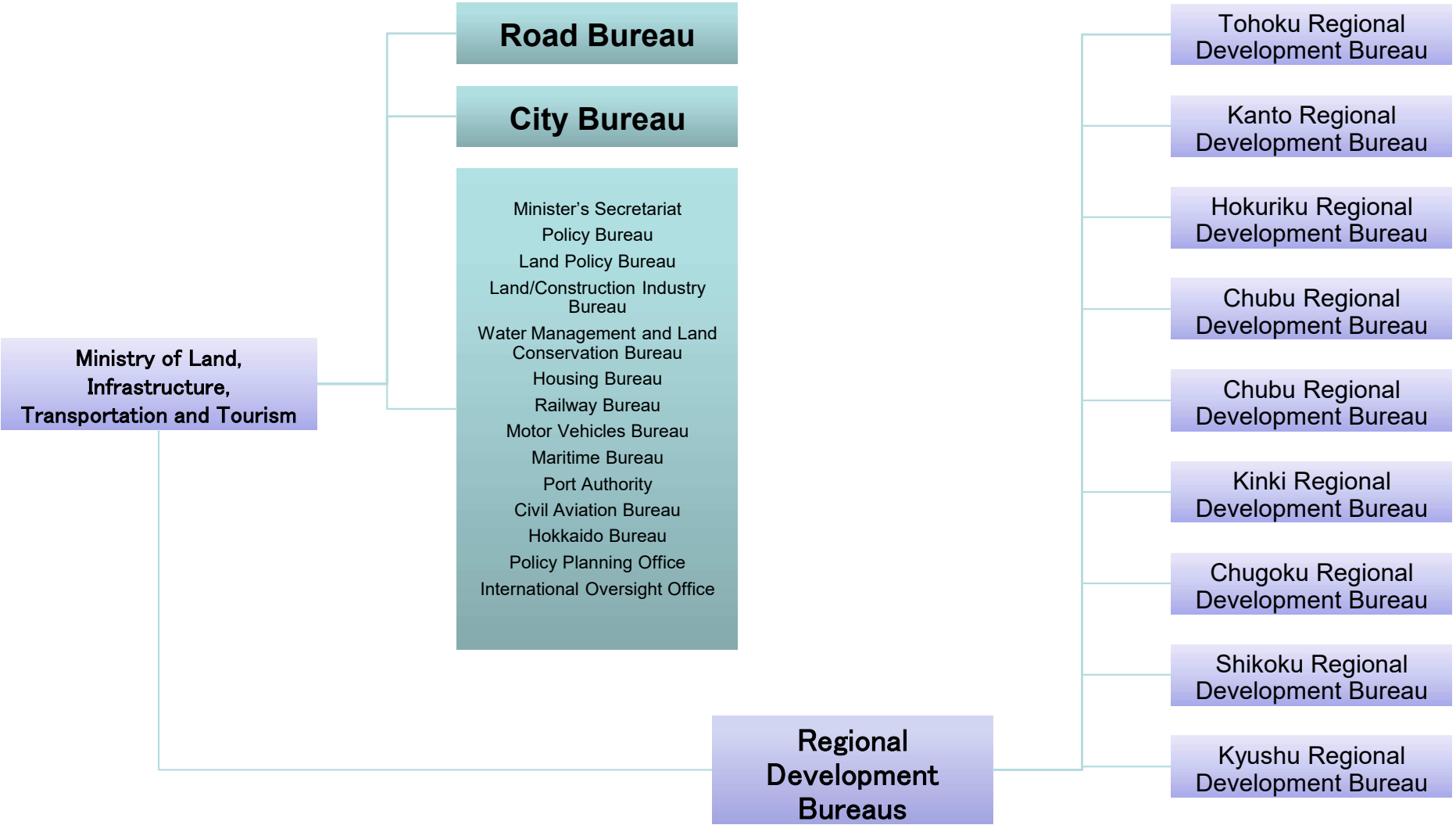
Japan’s administrative divisions consist of three levels, with the broad-based prefectural agencies and basic municipal agencies operating under the national government agencies.



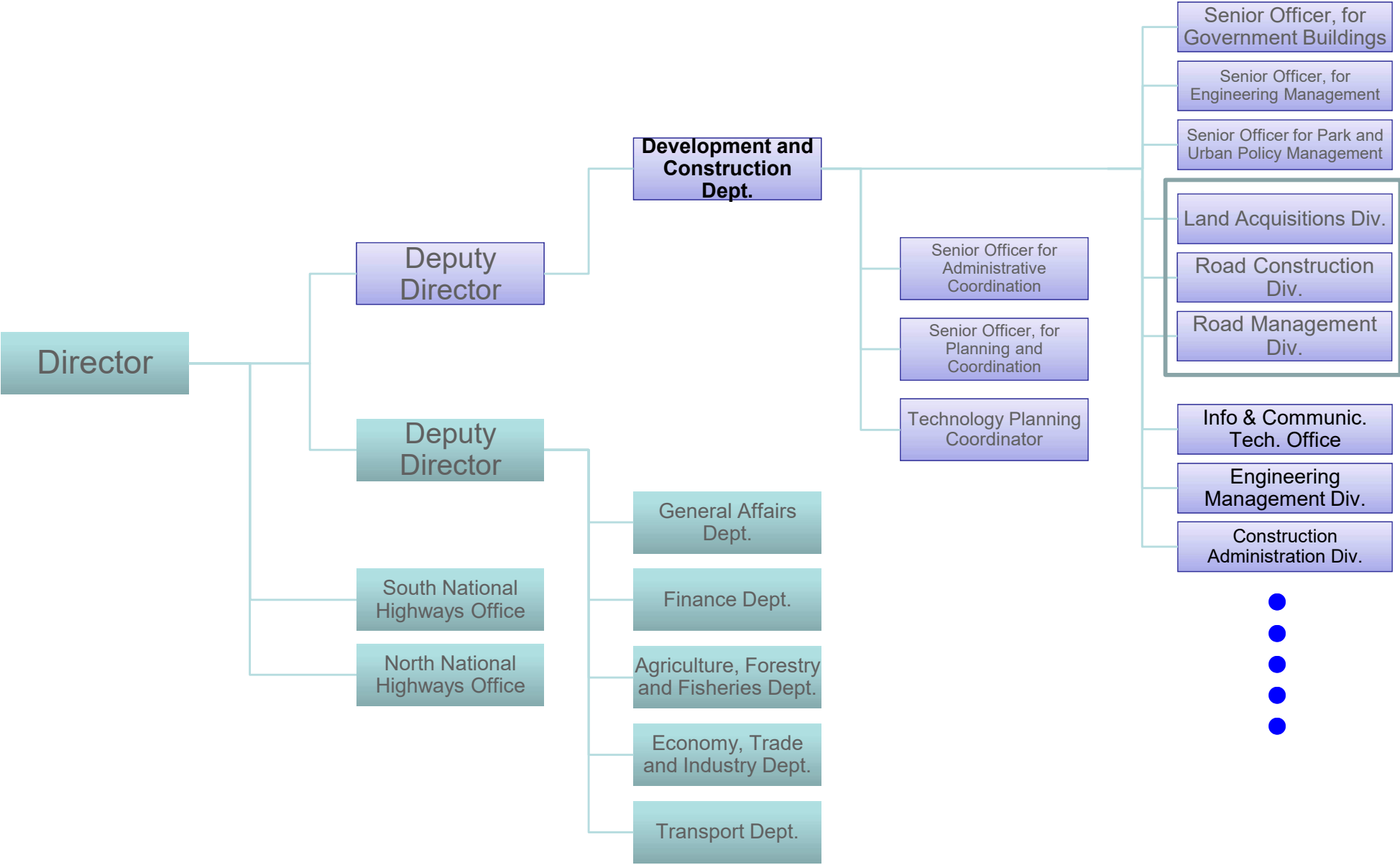
Japan is administered by the Cabinet Office and 12 Ministries, and the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) is generally responsible for road administration. However, the Cabinet Office is responsible for Okinawa Prefecture.



Regional Development Bureaus have been established in each district, as offices for the implementation and management of projects. In addition, in Hokkaido the Hokkaido Regional Development Bureau (also with jurisdiction over agricultural engineering) and in Okinawa the Cabinet Office Okinawa General Bureau have authority over development and construction.



Okinawa General Bureau Organizational Chart



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Okinawa is an island prefecture consisting of 160 islands, 49 inhabited and 111 uninhabited. It is located closer to Taiwan and Shanghai than to Tokyo.

Location of Okinawa Prefecture



Distances from Okinawa Main Island

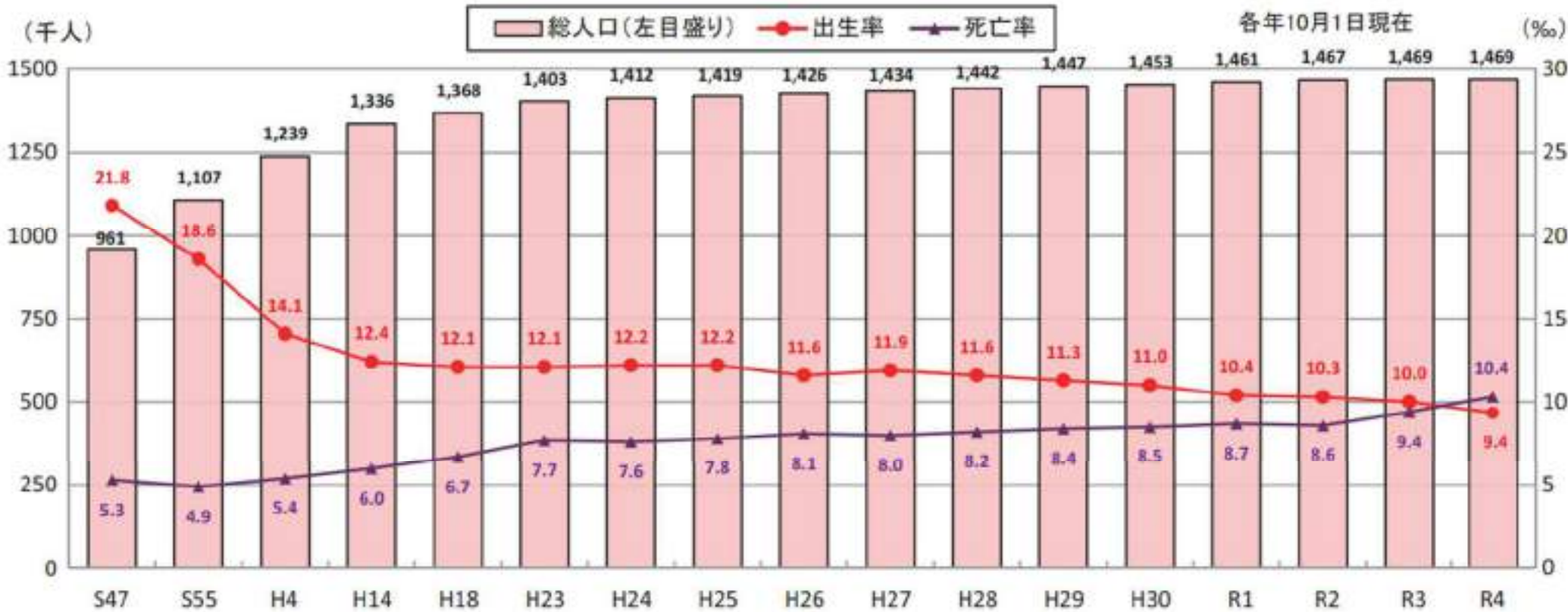


Source: Created based on Okinawa Planning Dept. “Island related Materials”

Source: Created from Okinawa Prefecture 2011 “A Look at Okinawa”

Okinawa prefectures has a population of about 1.4 million, and has a comparatively higher birth rate than the national average.

Total population ▪ Fertility rate ▪ Mortality



資料：総務省統計局「国勢調査」、「人口推計年報」、厚生労働省「人口動態統計」、県統計課「推計人口」

Source: Okinawa Prefecture “A Look at Okinawa(Prefectural Census Outline), June 2022”

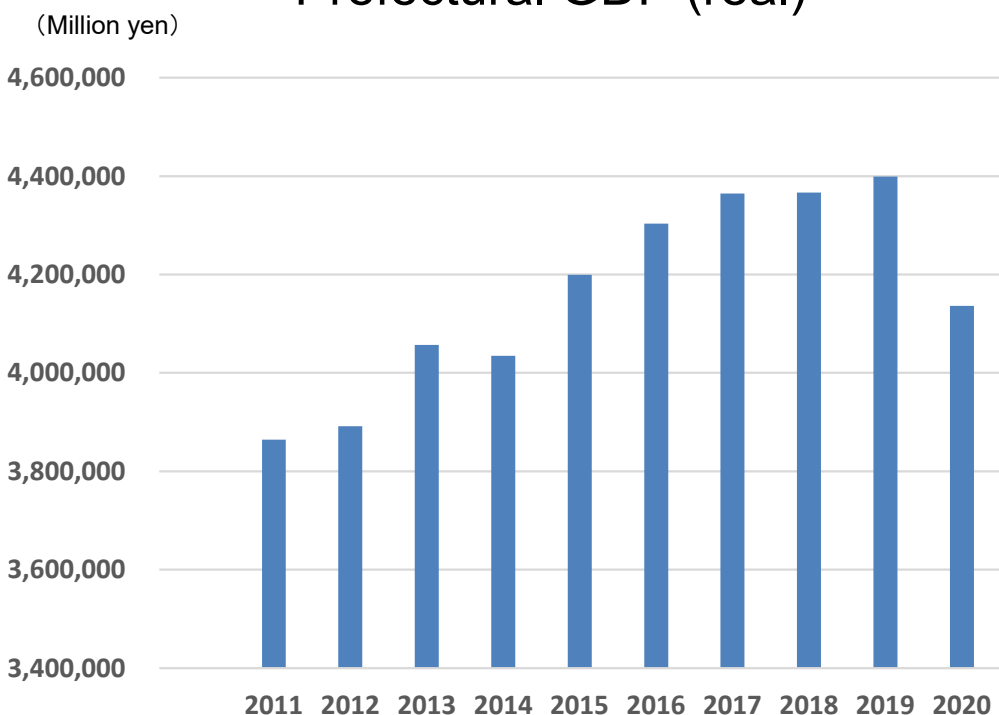
Okinawa’s prefectural GDP is on an upward trend, with a high proportion of tertiary industries.

Percentage of number of employees by industry (2021 average)



注：グラフは分類不能の産業を除く。ただし、全産業の就業者総数には、分類不能の産業を含む。
資料：総務省統計局「令和4年労働力調査年報」、沖縄県統計課「令和4年労働力調査年報」

Prefectural GDP (real)



■ 県内総生産(連鎖方式)

Source: Prefectural Planning Dept. Statistics Div.
“2023 Annual Labor Force Survey Report”

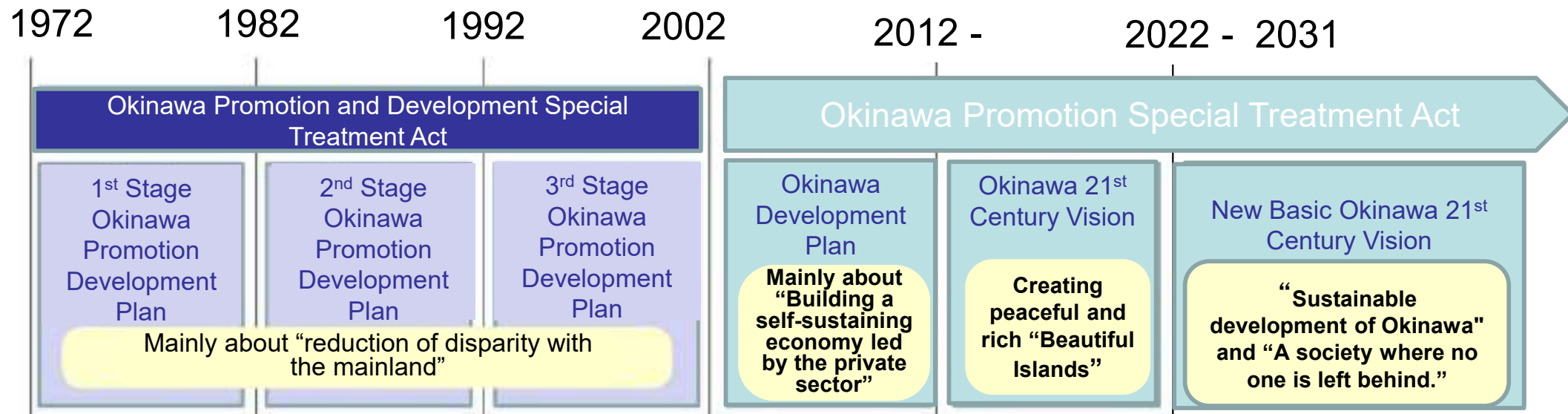
Source: Okinawa Prefecture Statistical Yearbook

Road Type and Development Status

Type of Road		Actual Length (km)	Percentage Improved (%)	Percentage Paved (%)
National Expressway		57.3	100	100
General Highways	Designated	332.2	100	100
		174.0	96.7	94.5
	Non-Designated Intervals	1,087.4	90.3	89.7
Prefectural Roads		6,599.3	65.4	42.1
Municipal Roads		8,250.2	71.0	52.2
Source: Roads Statistical Yearbook (2023)				

With the return to the mainland in 1972, the “Okinawa Promotion and Development Special Treatment Act” was enacted by the national government. Later, in 2002, the “Okinawa Promotion Special Treatment Act” was enacted.

Mainland
Return



This is one of the special measures for regional development as part of the nation's "balanced development" plan to boost self-sustaining development in areas where this is required due to certain constraints.

Special Circumstances of Okinawa

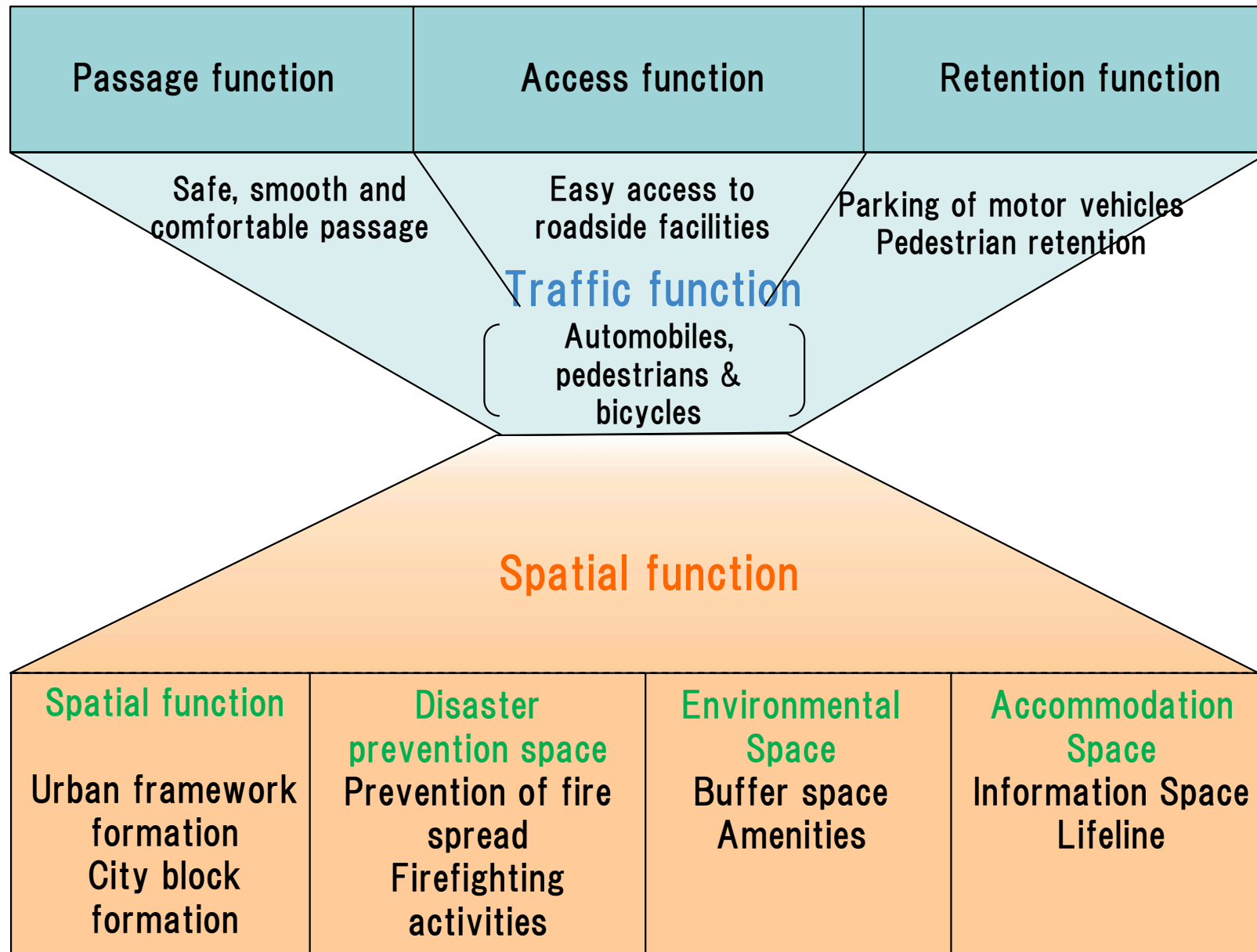
- ①The “**historical circumstances**” of not having been administered by Japan for a 26 year period.
- ②The “**geographical circumstance**” of there being a number of islands, remote from the mainland
- ③The “**natural circumstances**” of being in a subtropical region, rare to Japan
- ④The “**social Circumstances**” involved with the concentration of US military bases and areas

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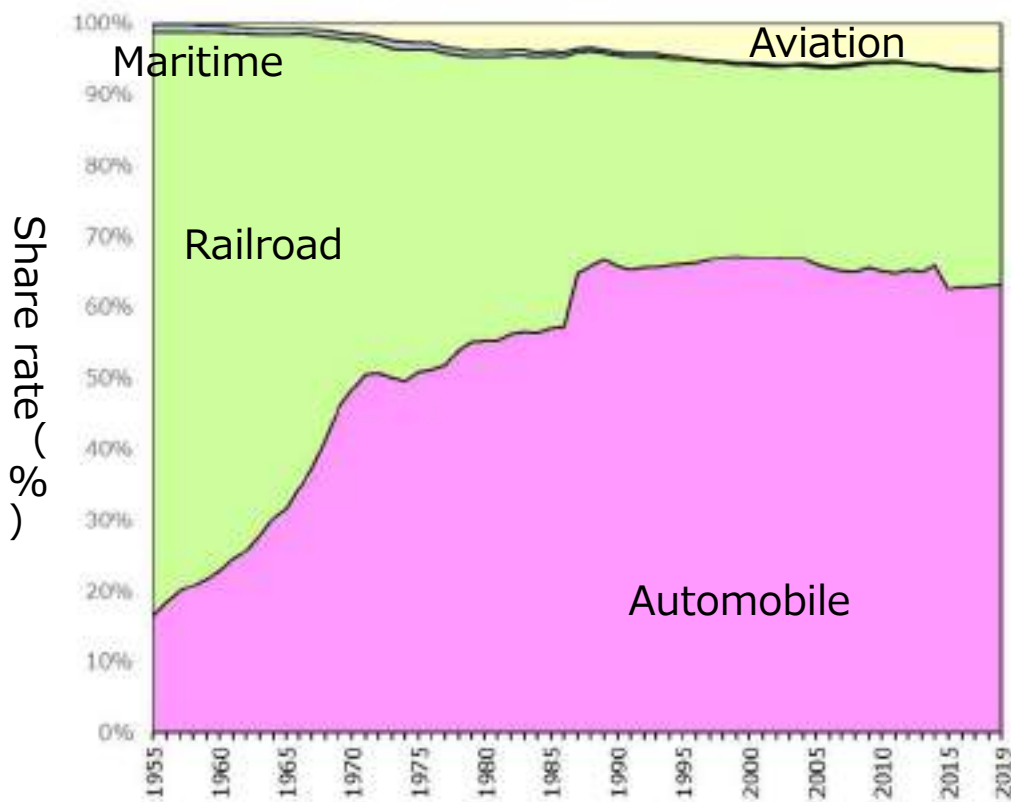
3. Measures Concerning Road Planning

○ There are two major road functions: “traffic function” and “spatial function.”



- Roads play a growing role in domestic transportation as the foundation of a comprehensive transportation system for both passengers and cargo.
- More than 60% of both passenger and freight traffic is by car.

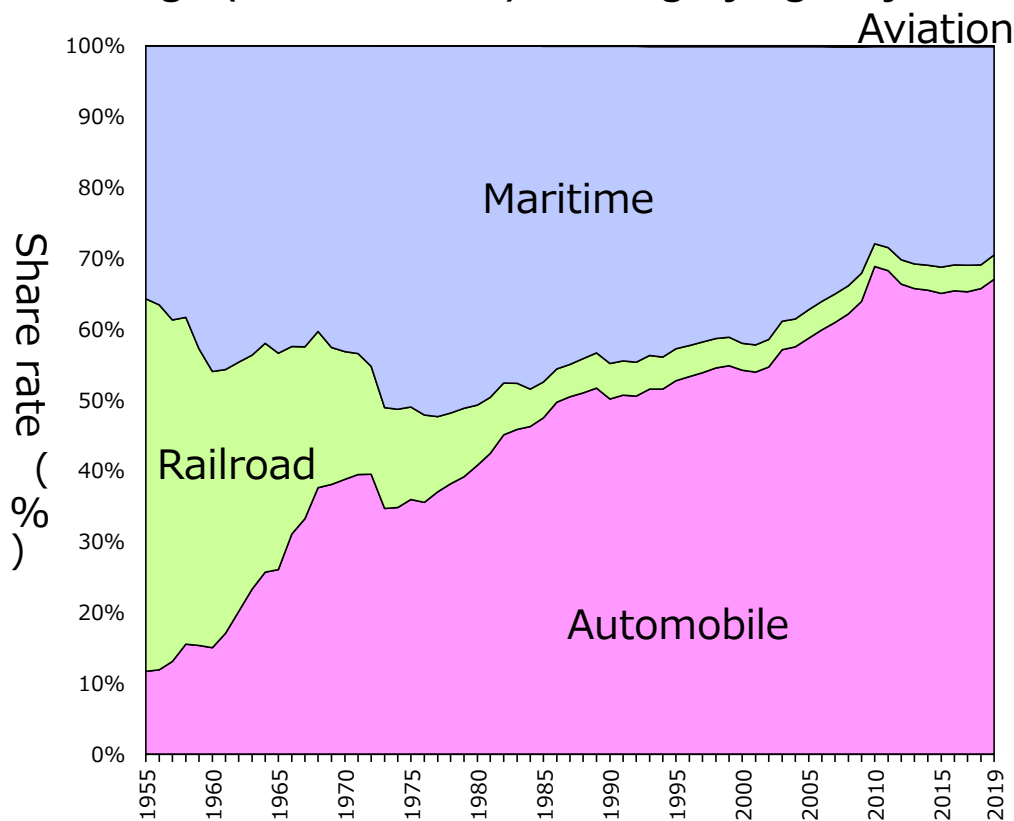
■ Passenger (person-kilometer) sharing by agency



(Sources: "Annual Report on Automobile Transport Statistics," "Annual Report on Railway Transport Statistics," "Annual Report on Air Transport Statistics," and for passenger ships, created based on the survey results of the Domestic Navigation Division of the Maritime Bureau)

Note: From FY 2010, the survey method and aggregation method of the "Annual Motor Vehicle Transport Statistics Report" have been changed, and private passenger cars and light vehicles have been excluded from the survey. This was supplemented by estimation based on the growth rate of vehicle kilometers traveled in the Annual Statistical Report.

■ Cargo (ton-kilometer) sharing by agency



(Sources: "Annual Report on Automobile Transport Statistics," "Annual Report on Railway Transport Statistics," "Annual Report on Air Transport Statistics," and for passenger ships, created based on the survey results of the Domestic Navigation Division of the Maritime Bureau)

Note: From FY 2010, the survey method and aggregation method of the "Annual Motor Vehicle Transport Statistics Report" have been changed, and private passenger cars and light vehicles have been excluded from the survey. This was supplemented by estimation based on the growth rate of vehicle kilometers traveled in the Annual Statistical Report.

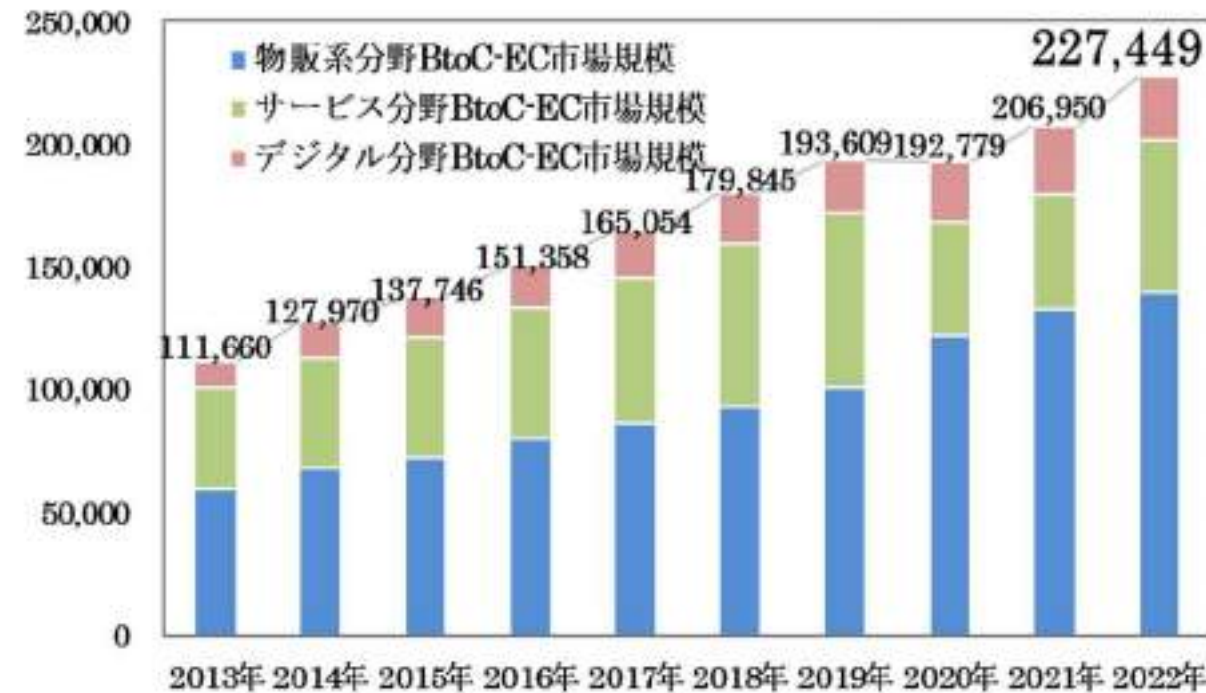


Satta Pass where
 National Route 1,
 Tomei Expressway
 and Tokaido Line
 converge



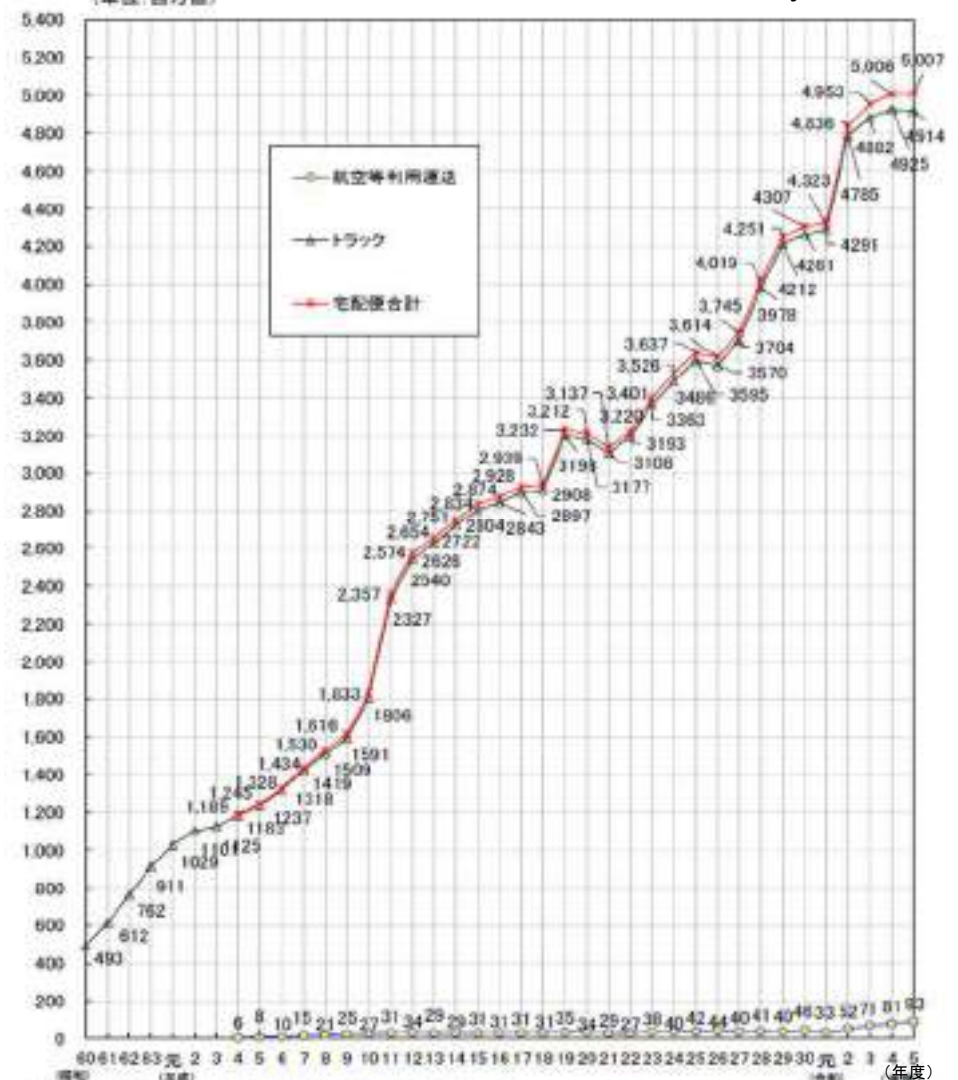
- Due to the significant expansion of e-commerce, the mail order market has grown to 22.7 trillion yen.
- The number of home deliveries has increased tenfold in 30 years.

[Trends in EC (electronic commerce) market size and EC conversion rate] (Unit: 100 million yen)



(Source: Survey results for the "FY2022 Digital Trade Environment Development Project (Market Survey on Electronic Commerce)" (Ministry of Economy, Trade and Industry))

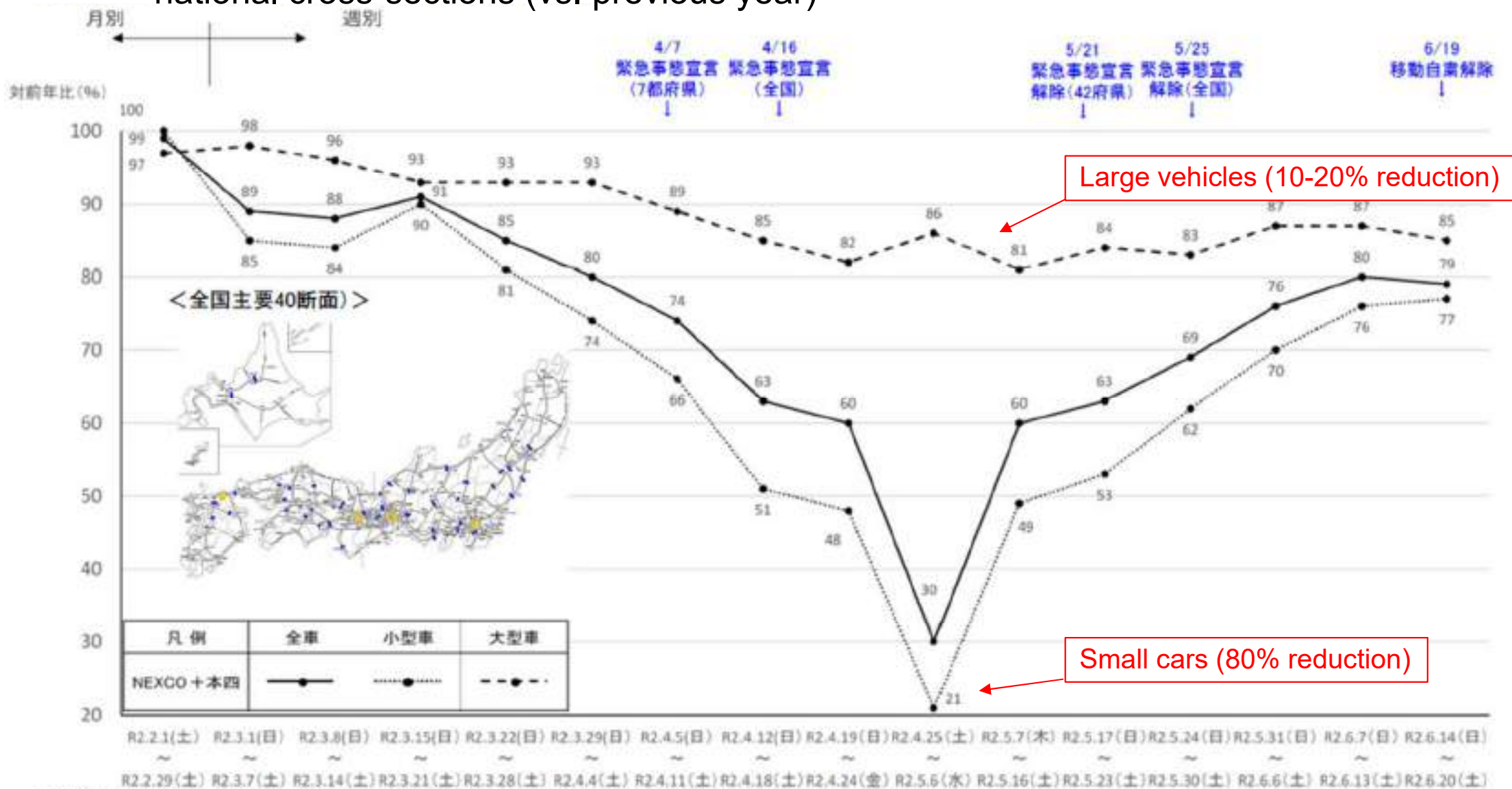
(Unit: million) 【Transition volume of home delivery service, etc.】



(Source: Survey of the number of parcels handled by courier services, etc. in fiscal 2023 (Bureau of Motor Vehicles))

Traffic volume during the coronavirus pandemic

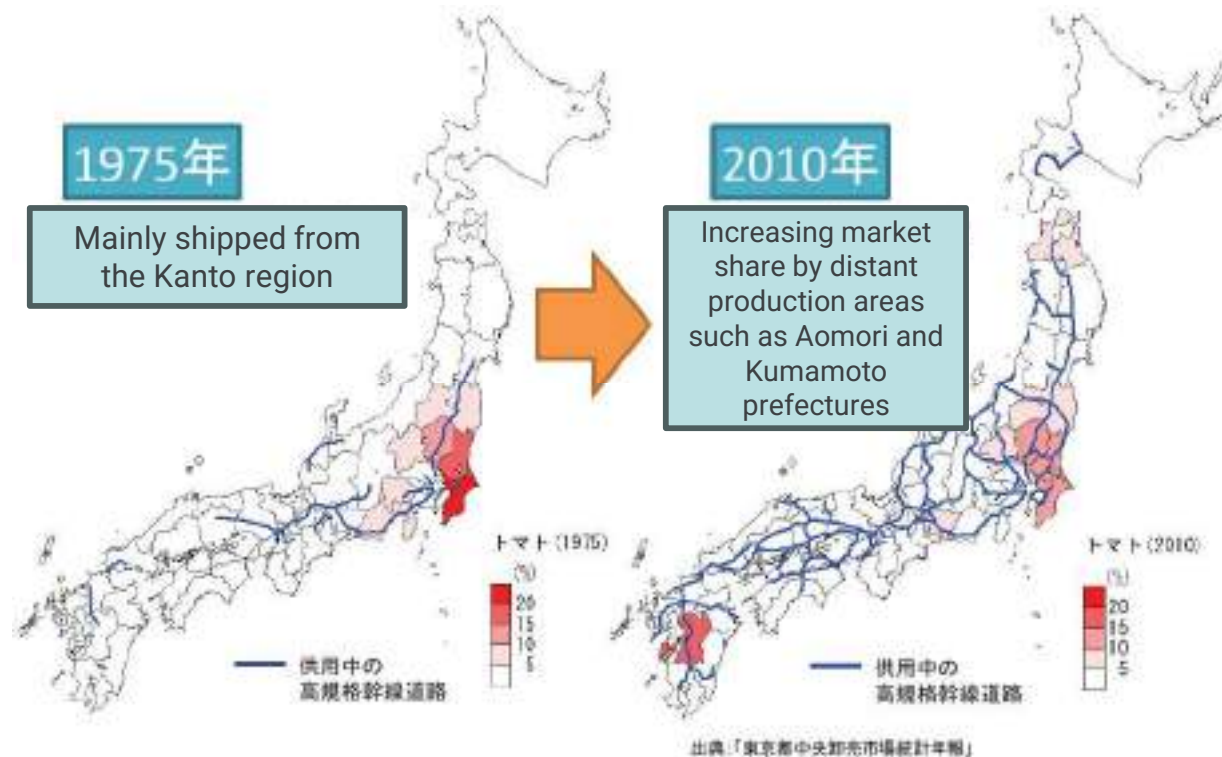
Weekly and vehicle-specific traffic volume on 40 major national cross-sections (vs. previous year)



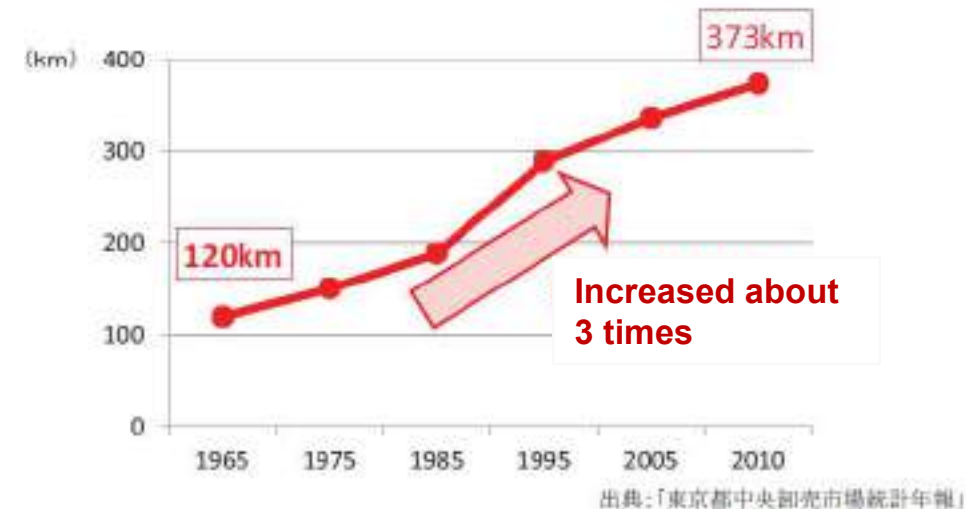
※NEXCO3社及び本四高速の高速道路に代表40断面を設定し、日平均交通量(トラカン等による速報値)を計測することにより調査
(繁忙期(GW、お盆、年末年始)に発表する高速道路の交通状況と同様の手法)

- Tomatoes arriving at the Tokyo Central Wholesale Market have increased their share in distant production areas.
- Average transport distance has tripled in about 50 years.

■ Prefectural share of tomatoes arriving in the Tokyo market and high-standard Highway Network



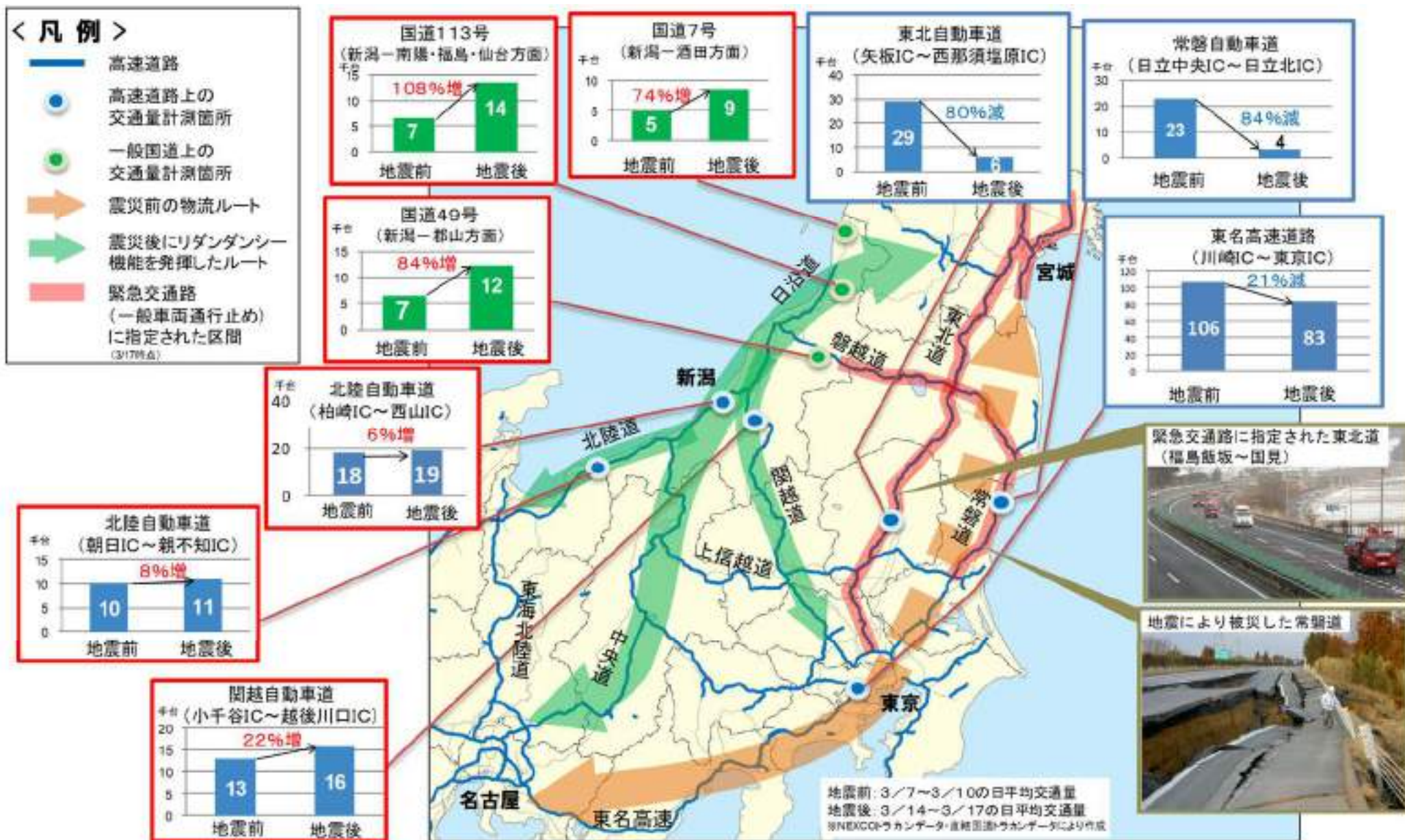
■ Average transport distance of tomatoes arriving in the Tokyo market from the production area (annual)



(Source: Material from the Expert Committee to Study the Expressway System, September 21, 2011)

Roads that support rescue and relief activities in disaster

- After the Great East Japan Earthquake in 2011, the road network between Tohoku and Kanto was restricted, and traffic volume on the roads along the Sea of Japan increased. (Hokuriku Expressway: approx. 10%, Kan-etsu Expressway: approx. 20%, National Highways under direct control: approx. double)



○As function of urban development, "roads" are essential.

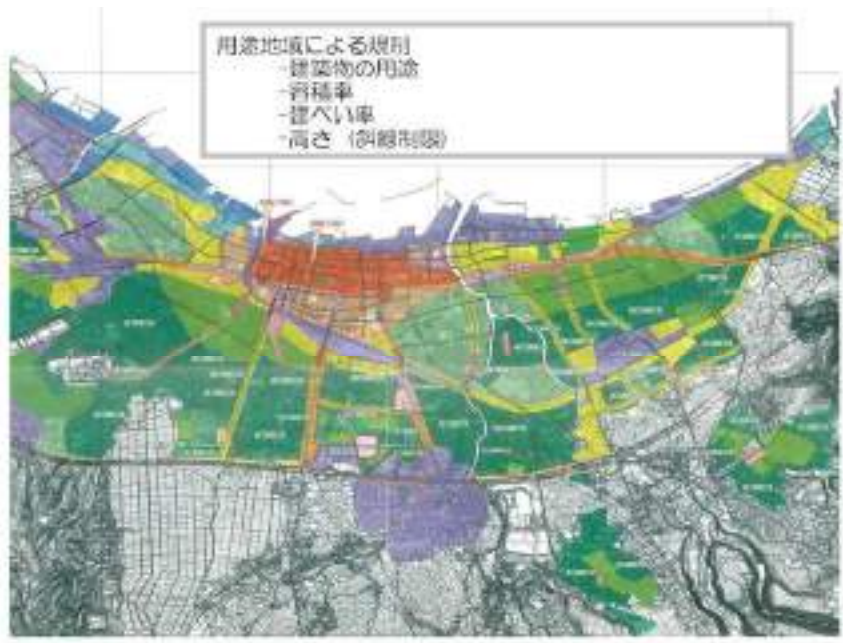
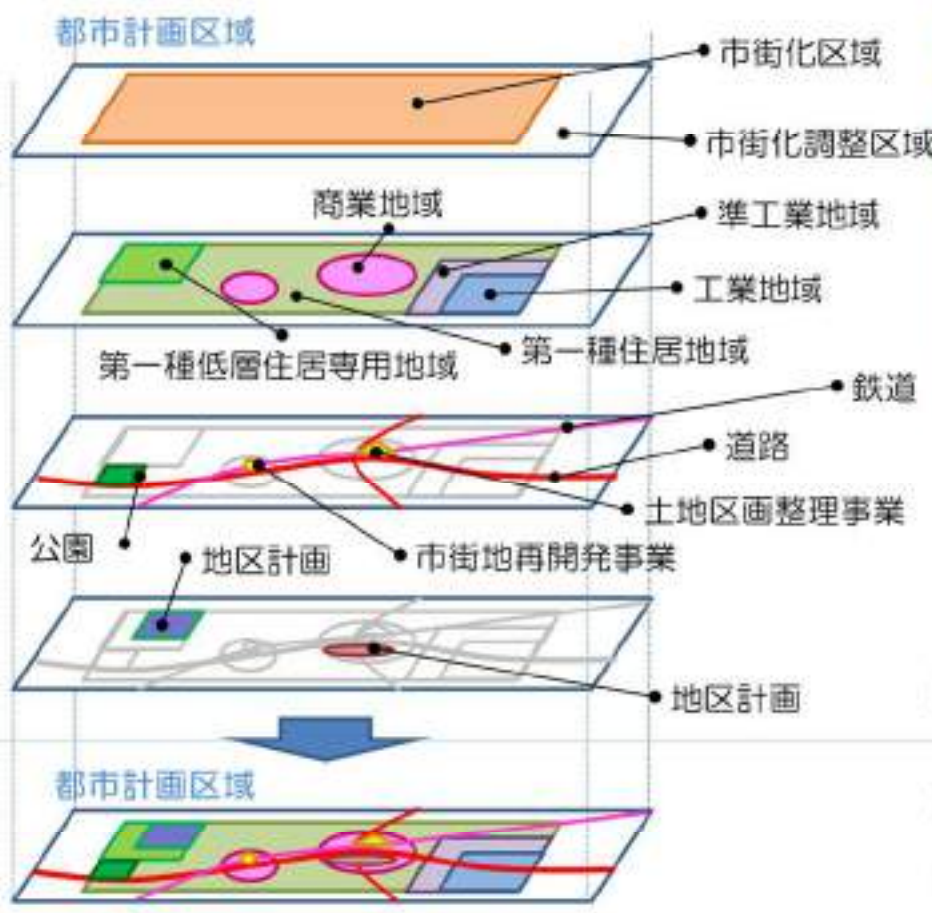
Area classification

Regional districts (Ex: areas of use)

Urban facilities
Urban development projects

District planning

Sketch of overall city plan



○ It has functions as an environmental space such as landscape improvement, environmental conservation, traffic safety, green shade formation, and disaster prevention.



Landscape improvement function

The objective of this project is to improve the overall landscape of the area, including roads and roadside areas, by combining the functions of ① landscaping, ② landscape integration and harmony, ③ shielding, and ④ fostering a sense of attachment to the area.

Environmental conservation function

① The living environment that will be the place of life for residents along the road, ② The natural environment that will be the habitat and growth space for wild animals and plants around the road, and ③ Contributing to the conservation of the global environment that requires measures to combat global warming and heat islands.



Traffic safety function

Contributing to ensuring safe and smooth road traffic through various functions classified into ① shading, ② visual guidance, ③ traffic separation, ④ indicators, and ⑤ impact mitigation.

Green shade formation

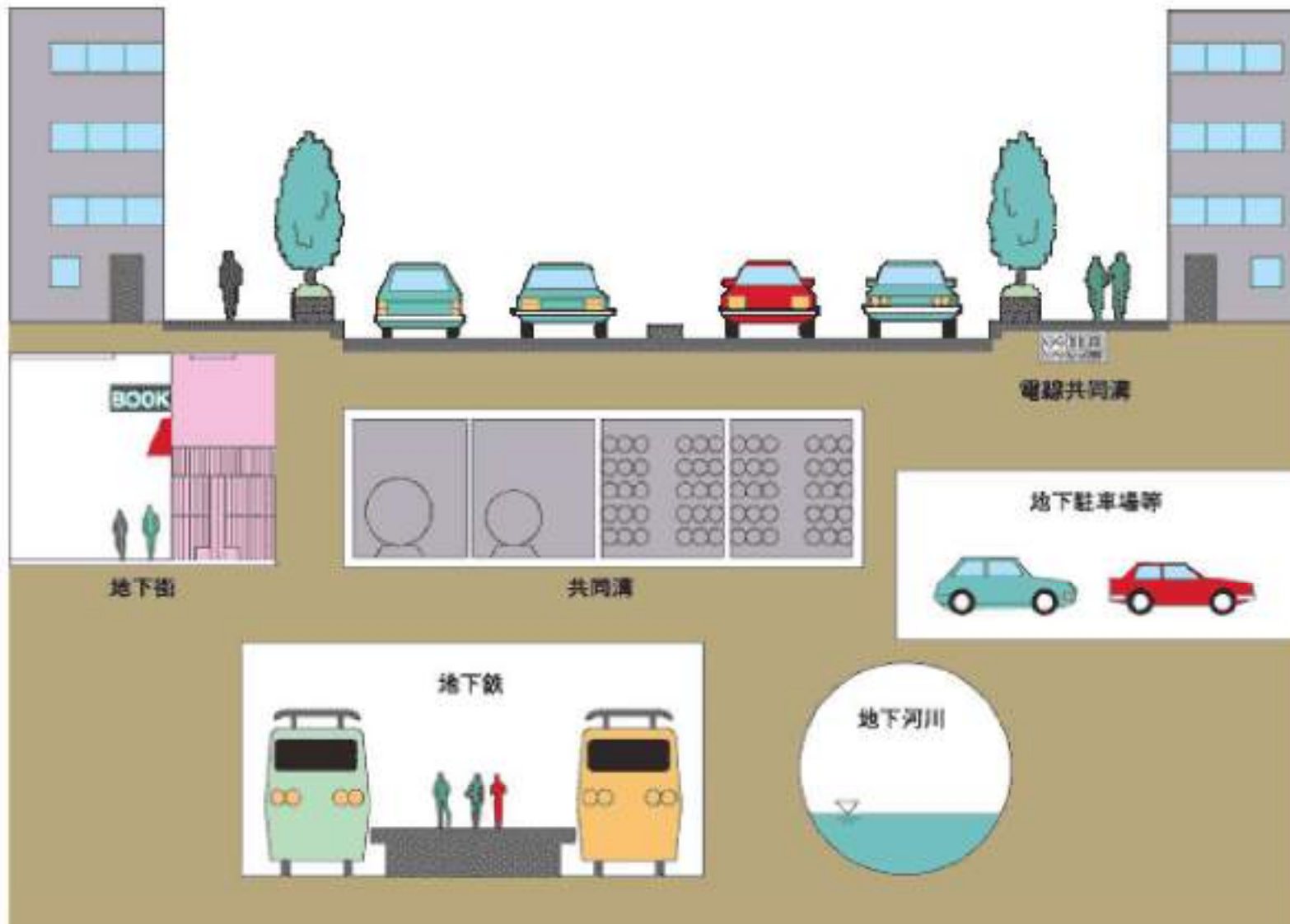
The canopy of trees covers the sky, creating shade and providing road users with a comfortable space to rest and take a break, in addition to traveling.

Disaster prevention

① Traffic obstruction caused by sand blown from the roadside, etc. ② Preventing erosion caused by wind and rain, etc. ③ Spread of fire ④ Building collapse

Road as lifeline accommodation space

- One of the most important spatial functions of a road is its function as a space for accommodating lifelines, etc.
- In large urban areas, water, sewage, electricity, and gas are accommodated in an integrated manner as communal ditches.



Monorails such as Yurikamome and the like have tracks laid above the road.

This function is also important for use in plazas, parks, garbage disposal, streetcars, telephones, etc.

○ By constructing wide roads, we will prevent fires from spreading to houses and other structures in the event of a large-scale earthquake.

■ Effect on preventing the spread of fire on roads



Photo: Southern Hyogo Prefecture Earthquake (January 17, 1995) Fire situation (near Nagata Ward, Kobe City)

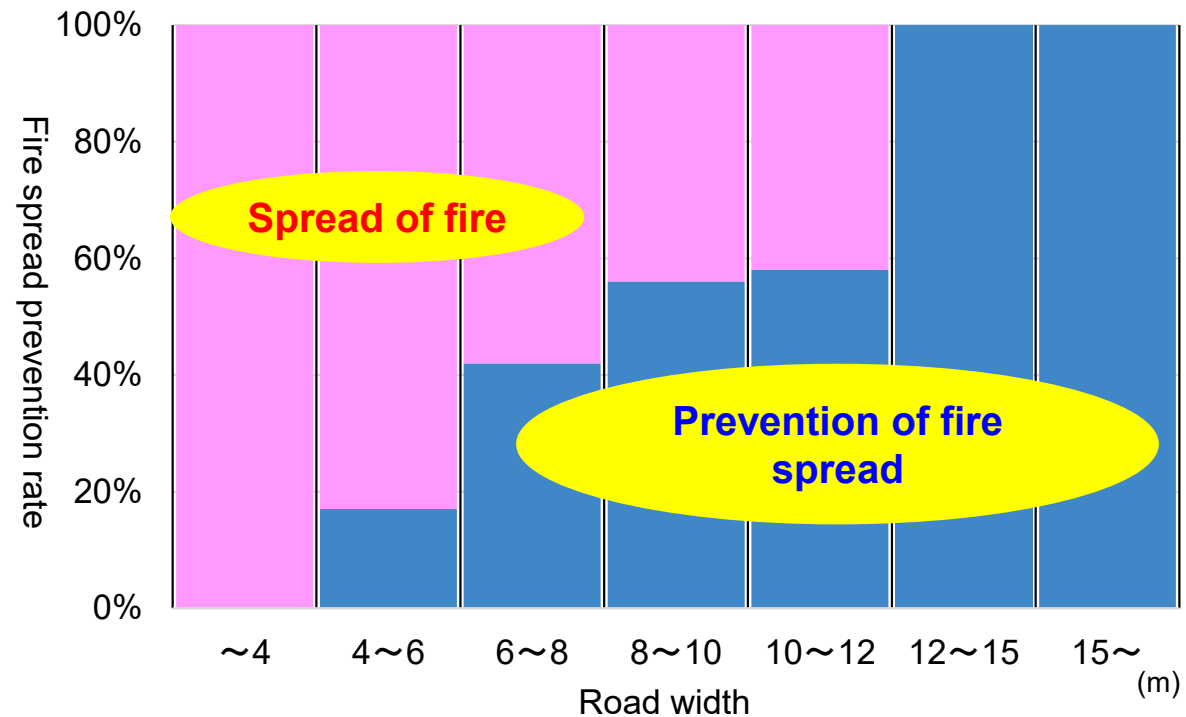


Figure: Relationship between road width and fire spread prevention rate (case study of Nagata Ward, Kobe City)

In the Hyogo Prefecture Southern Earthquake, the effect of preventing the spread of fire on wide roads was confirmed.



Functions as a
transportation
road for
restoration

Functioned as an
evacuation site for
residents
immediately after the
disaster struck



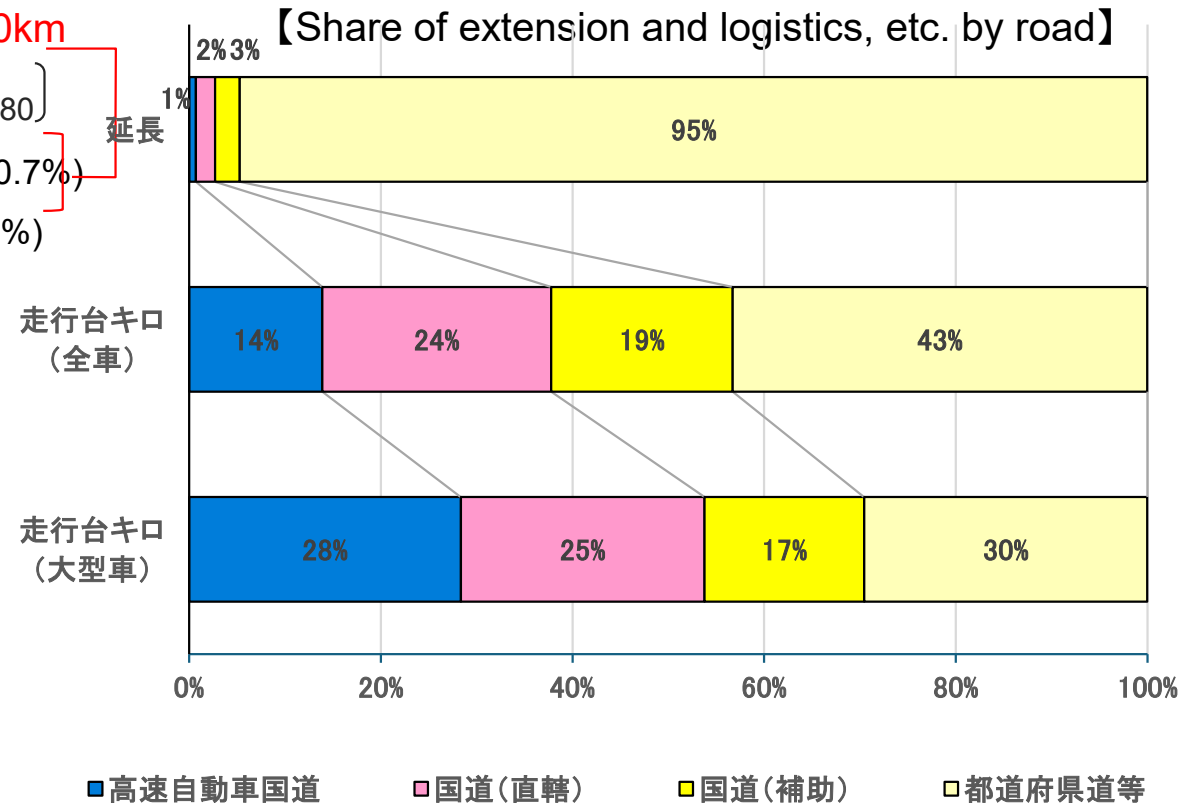
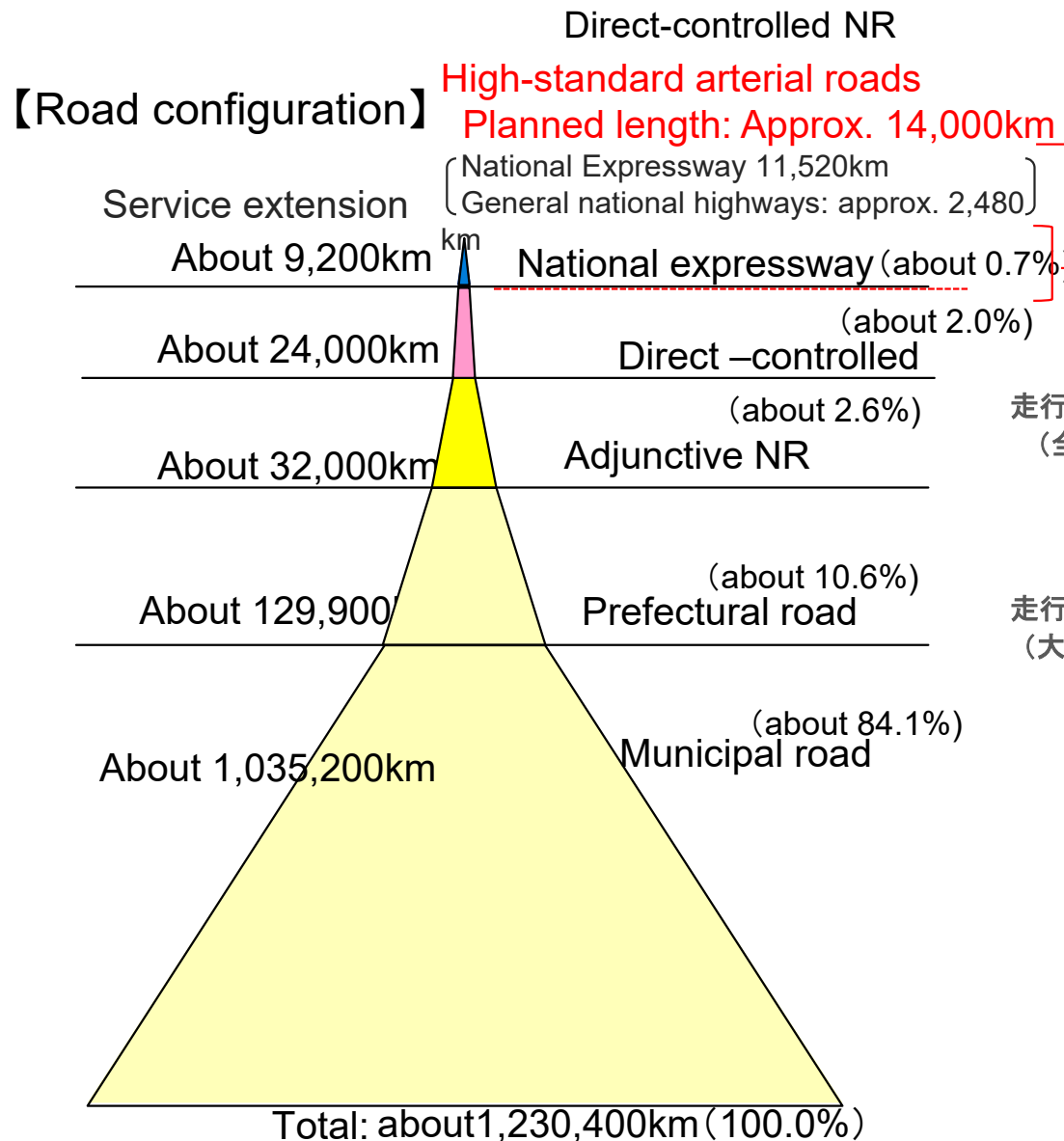


Functions as a breakwater to prevent debris from entering

Functions as a relay base for the Self-defense Forces and fire brigade

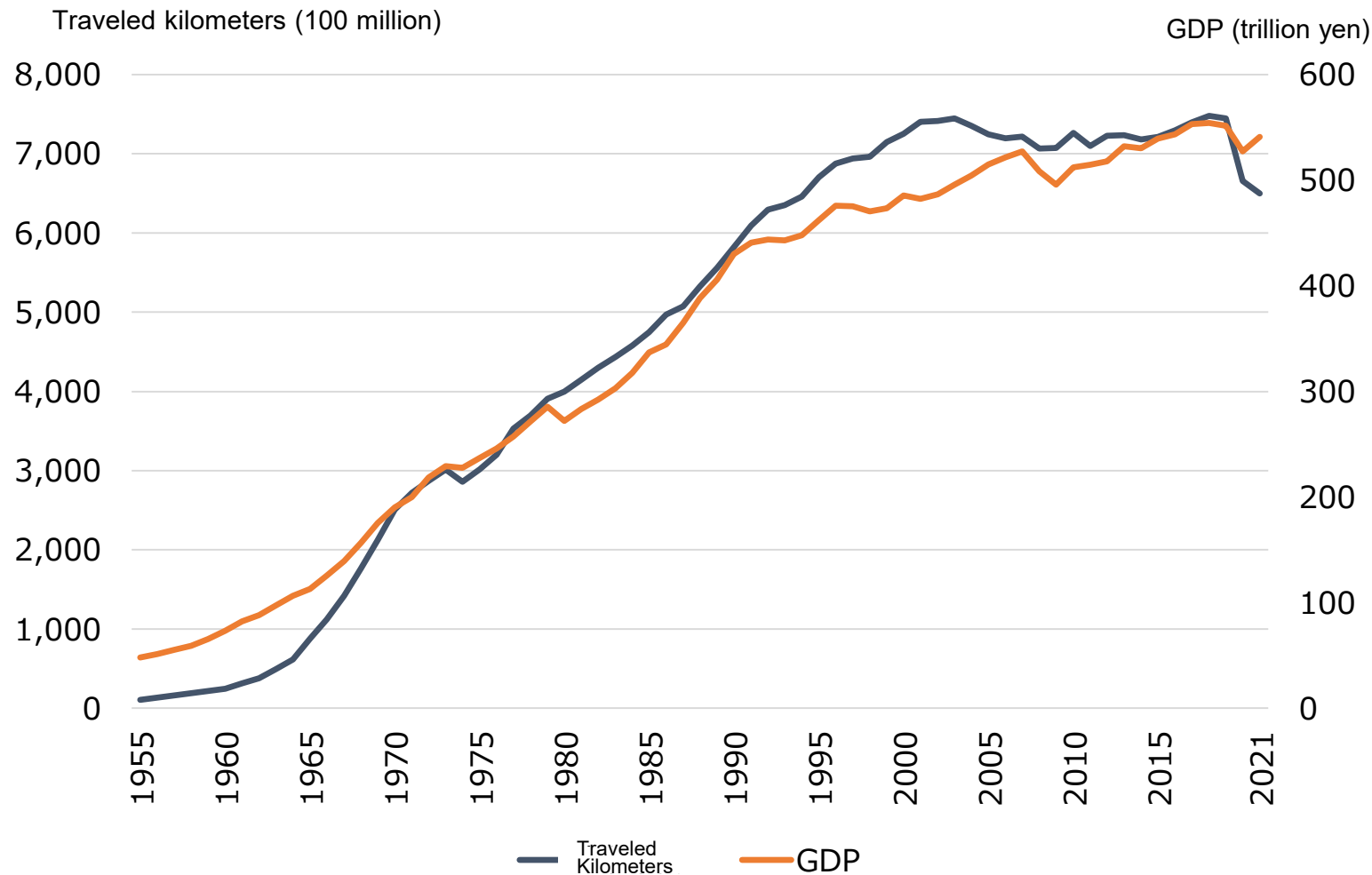


- Japan has a road network of about 1.2 million km from expressways to municipal roads.
- National Highways and National roads under direct control have a low extension ratio, but they share about 30% of the total traffic volume and about 50% of the freight car traffic.



※Regarding national highways, as of April 2020. Other information is as of April 1, 2020.
 ※Driving vehicle kilometers are based on the "2015 National Road and Street Traffic Situation Survey" and the "2015 Automobile Fuel Consumption Statistics Annual Report."

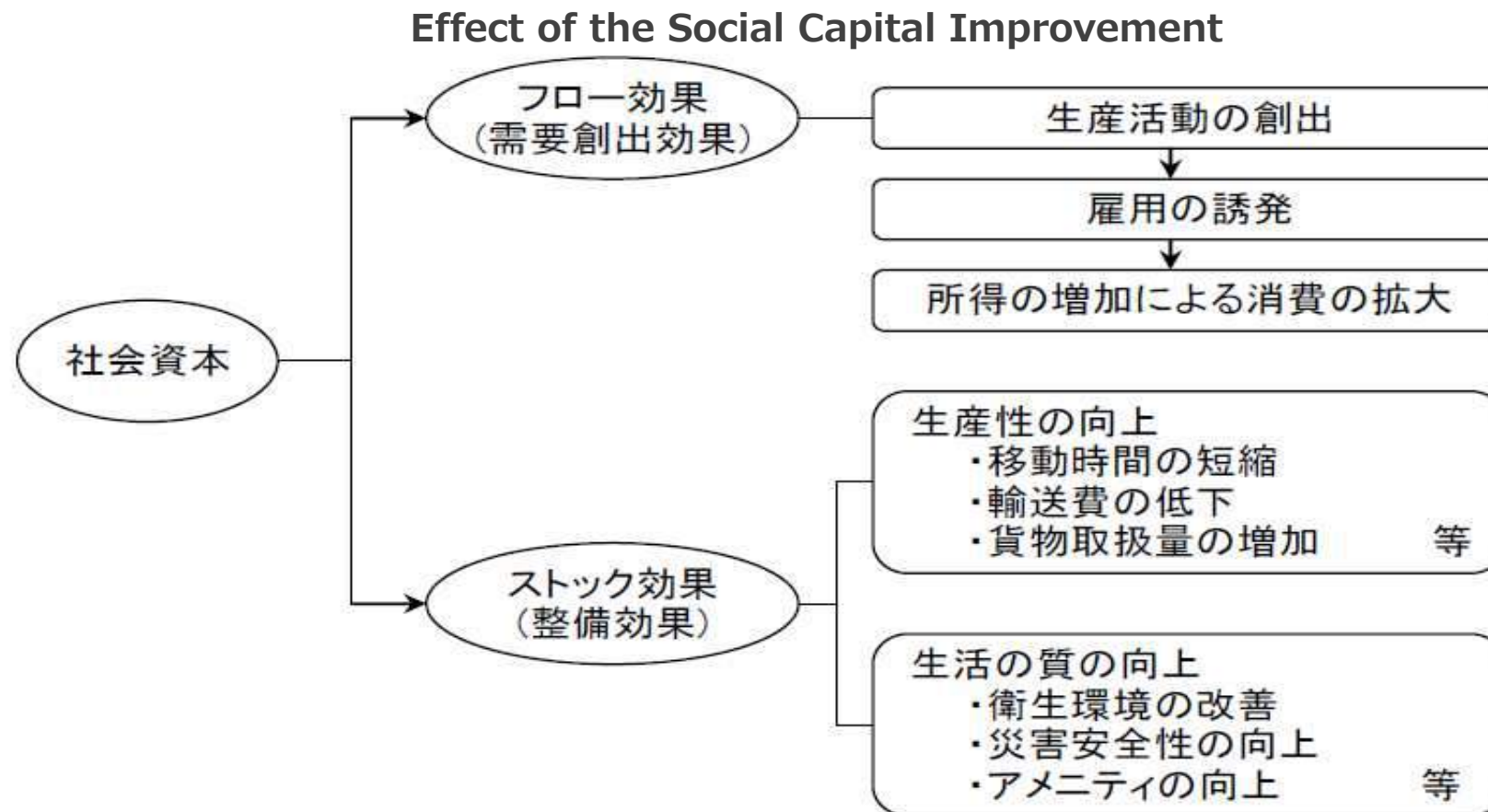
- With the development of the economy, the number of kilometers traveled by automobile has also increased.
- Road maintenance has supported automobile traffic.



Note 1: GDP up to 1979 is based on 1990. Until 1993, it was based on 2005. After 1994, the actual values are based on the 2015 baseline.
Note 2: The traveled kilometers up to 2009 are values converted based on the connection coefficients of the old and new statistical values.
<Source> GDP is according to the "Annual Report of National Accounts" of the Economic and Social Research Institute of the Cabinet Office. The traveled kilometers of automobile are based on the Ministry of Land, Infrastructure, Transport and Tourism's "Transportation-related Statistical Data Collection" and "Automobile Fuel Consumption Statistics Annual Report FY2010)."

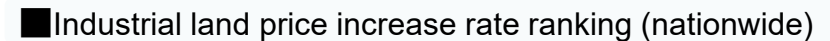
	(戦後)	1950年代	1960年代	1970年代	1980年代	1990年代	2000年～現在
計画			■全国総合開発計画(62) ■新全国総合開発計画(69)	■第三次全国総合開発計画(77) ■第四次全国総合開発計画(87)		■21世紀の国土のグランドデザイン(98)	■国土形成計画(08)
計画		第1～7次道路整備五箇年計画		第8～11次道路整備五箇年計画		新道路整備五箇年計画(98)	社会資本整備重点計画(03) 社会資本整備重点計画(08)
建議書等				○建議(82) 「今後の道路整備のあり方」 ○建議(87) 「確かな明日へのみちづくり」 ・高規格幹線道路の要件	○建議(92) 「ゆとり社会のためのみちづくり」 ・地域高規格道路、ITS、道の駅、TDM ○建議(97) 「道路政策変革への提言」 ・評価システム、パートナーシップ	○中間答申(02) 「今、転換のとき」 ・弾力的な料金施策 ○建議(07) 「品格ある国土と快適な生活の実現に向けた道路政策」	
	戦後の荒廃と距離・砂利道の克服 近代道路行政の諸制度の構築			モータリゼーションの飛躍的進展、 高度経済成長の基盤としてのネットワークの構築		情報、環境、福祉等時代の 新たな要請への対応	
主要な施策	○国道等の舗装や改良	【広域交通基盤の構築】 ○初の高速道路(名神)開通(63) ○7600kmのネットワーク計画(66) 【道路の信頼性の向上】 ○第1回防災総点検(63)(飛騨川バス転落事故) 【交通安全対策】 ○交安法制定(66) ○交通安全3ヶ年計画開始(66) <事故死者数約1万7千人(70)> 【環境・沿道対策等】 ○騒音環境基準(71) ○沿道法制定(80) ○NOx環境基準(78) ○電線類地中化開始(87) 【交通円滑化】 ○道の駅(93) ○京都議定書(97)(COP3) ○OTDM(93) ○都市圏交通円滑化総合対策事業(99) ○渋滞対策プログラム(88) 【情報化の推進】 ○ITS ○VICSの開始(96) ○ETCの開始(97) 【進め方等】 ○事業評価システムの導入(98) ○PFI方式の導入(02)					
	○道路特定財源(54) ○有料道路制度(53)						○道路関係4公団民営化(05) ○一般財源化(09)
基準等	現行道路法(52)	設計速度、計画交通量の概念 歩道規定(58)	高速自動車国道等の構造基準(63)	自動車専用道路の規定(70)	環境施設等(82)	歩道等幅員拡大、橋梁の設計荷重引き上げ(93)	歩車共存道路(01) 小型道路(03)

- Flow Effect: an effect can be derived by economic activities such as production, employment and consumption through public investment, and the whole economy can be benefited in the short term.
- Stock Effect: an effect can be obtained continuously in the medium to long term through the improved social capital.
 - Improving the efficiency and productivity of the economic activities
 - Improving hygienic environment, strengthening disaster preparedness and creating comfort and affluence in daily life.



Source) Cabinet Office "social capital in Japan 2012"

- ## Effects of the Metropolitan Ring Road



Source: Prefectural Land Price Survey (Ministry of Land, Infrastructure, Transport and Tourism)

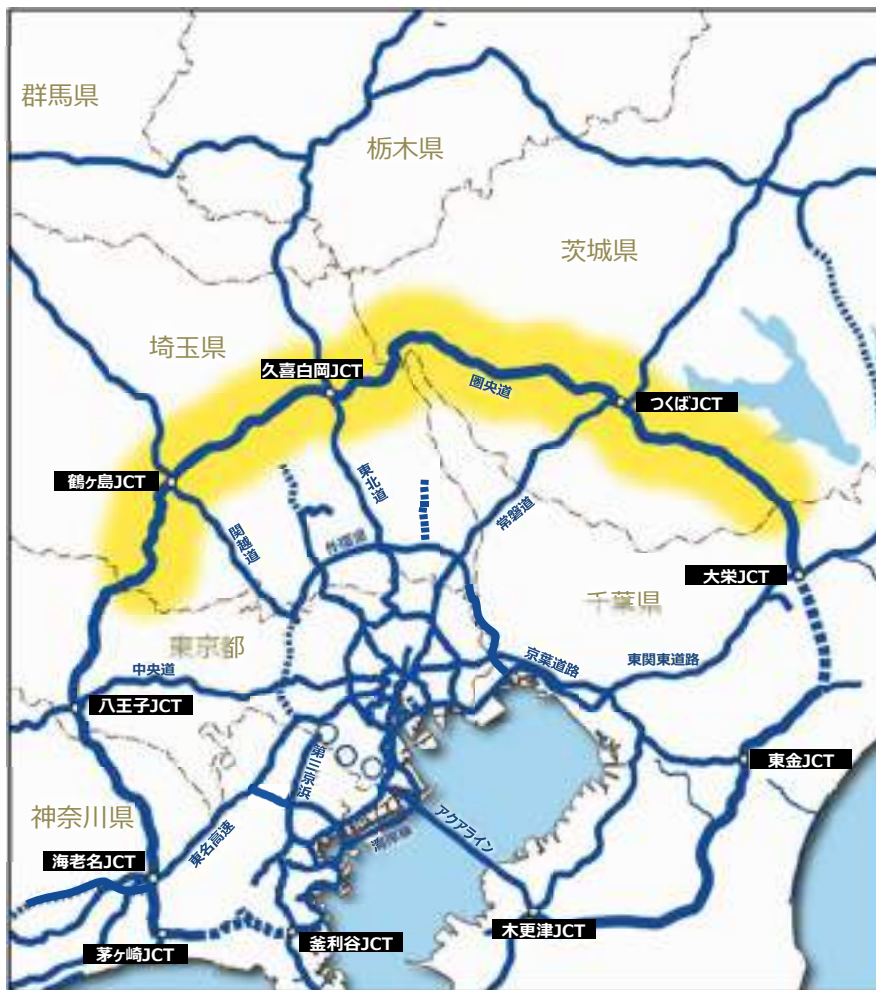
Large-scale multi-tenant logistics facilities are designed to provide efficient sorting, distribution, and delivery of a wide variety of products to many individual households.



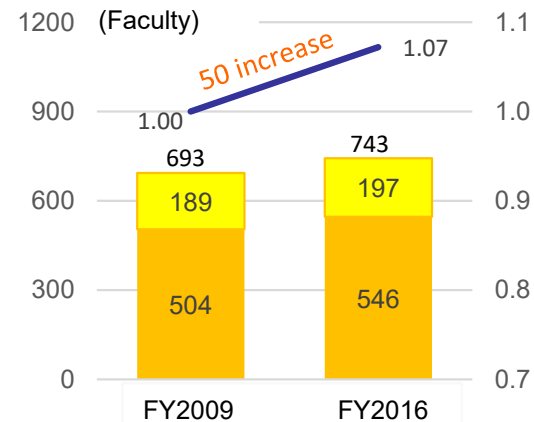
Stock effect ②: Examples of increases in employment and tax revenues

○Saitama and Ibaraki prefectures are actively promoting business attraction with the aim of promoting industry within the prefecture, creating employment, and securing tax revenue.

⇒ Business locations and investments are progressing in areas along the Metropolitan Ring Expressway, and the number of employees is increasing, as well as tax revenue.

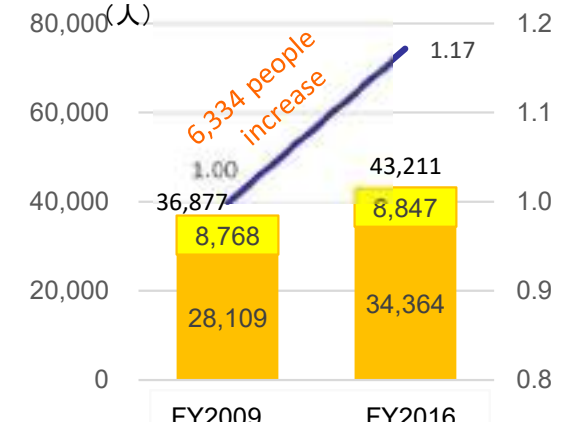


Location of large logistics facilities, etc.※1,2



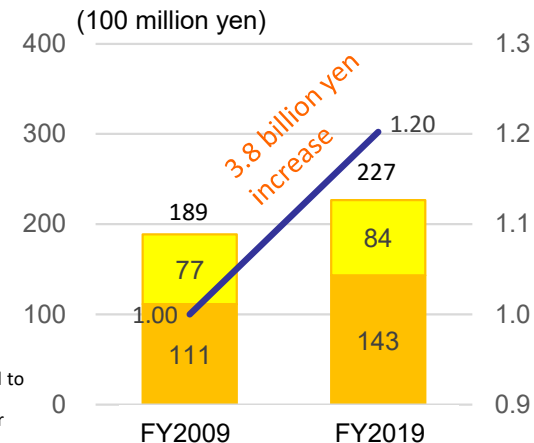
Source: Economic Census

Number of employees at large logistics facilities, etc.※1,2



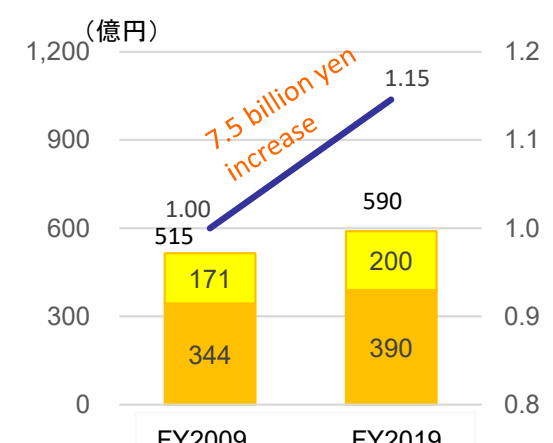
Source: Economic Census

Corporate tax revenue ※3



Source: Survey of Local Government Finances

Fixed property tax (house)※4



Source: Survey of Local Government Finances

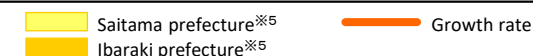
※1 Total of "Road passenger transport," "Road freight transport," "Warehousing," and "Services incidental to transport" in the industrial classification of privately-owned establishments in the Economic Census

※2 Excluding "small business operators (generally businesses with 20 or fewer full-time employees)" under the Small and Medium Enterprise Basic Act.

※3 Corporate tax revenue: Sum of corporate tax rate and corporate equalization rate of municipal inhabitant tax

※4 Property tax (house): Tax imposed on the assessed value of fixed assets (house)

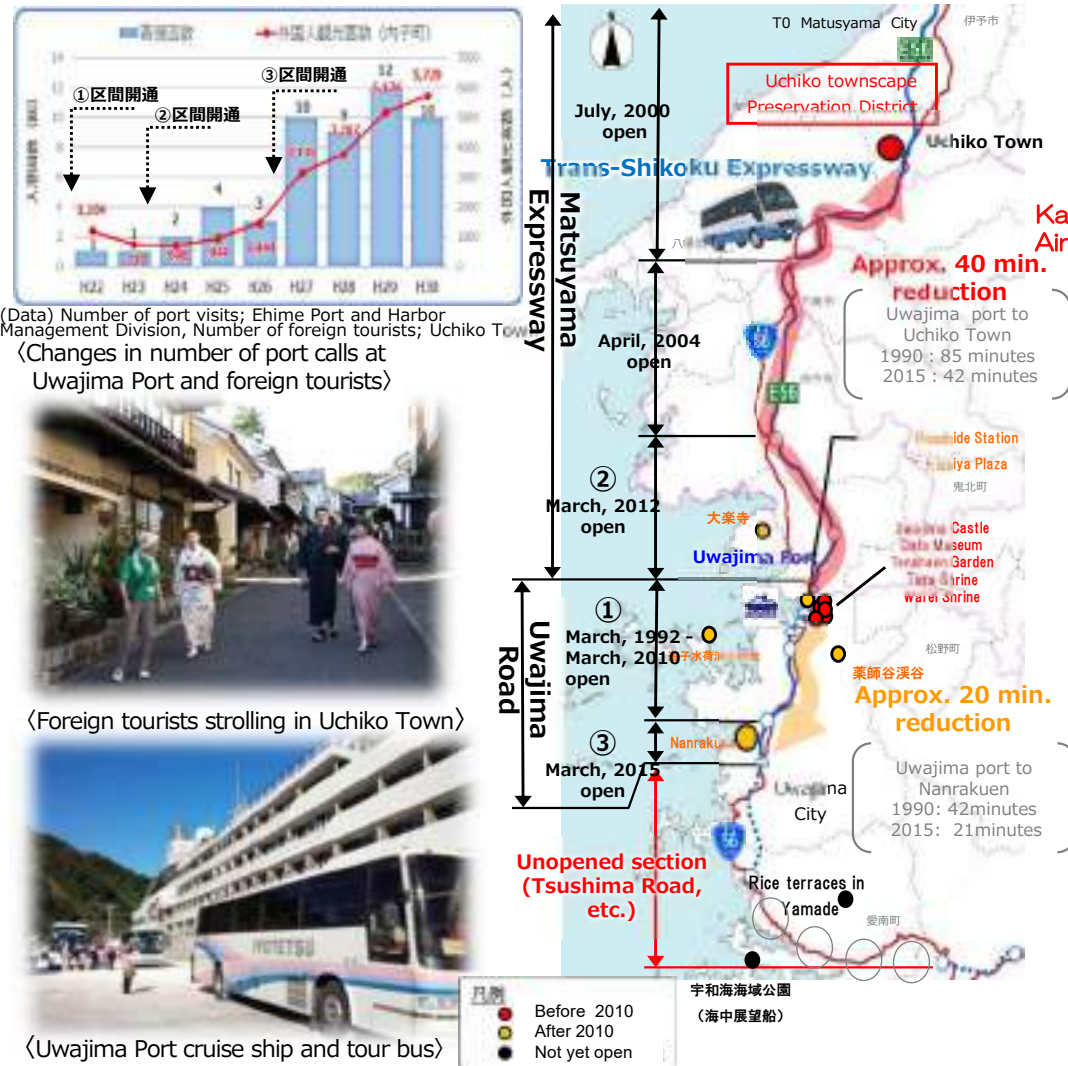
※5 Municipalities along the route: Cities and towns through which the Ring Expressway (Saitama to Ibaraki Prefectures) passes (15 cities and towns in Saitama Prefecture, 9 cities and towns in Ibaraki Prefecture)



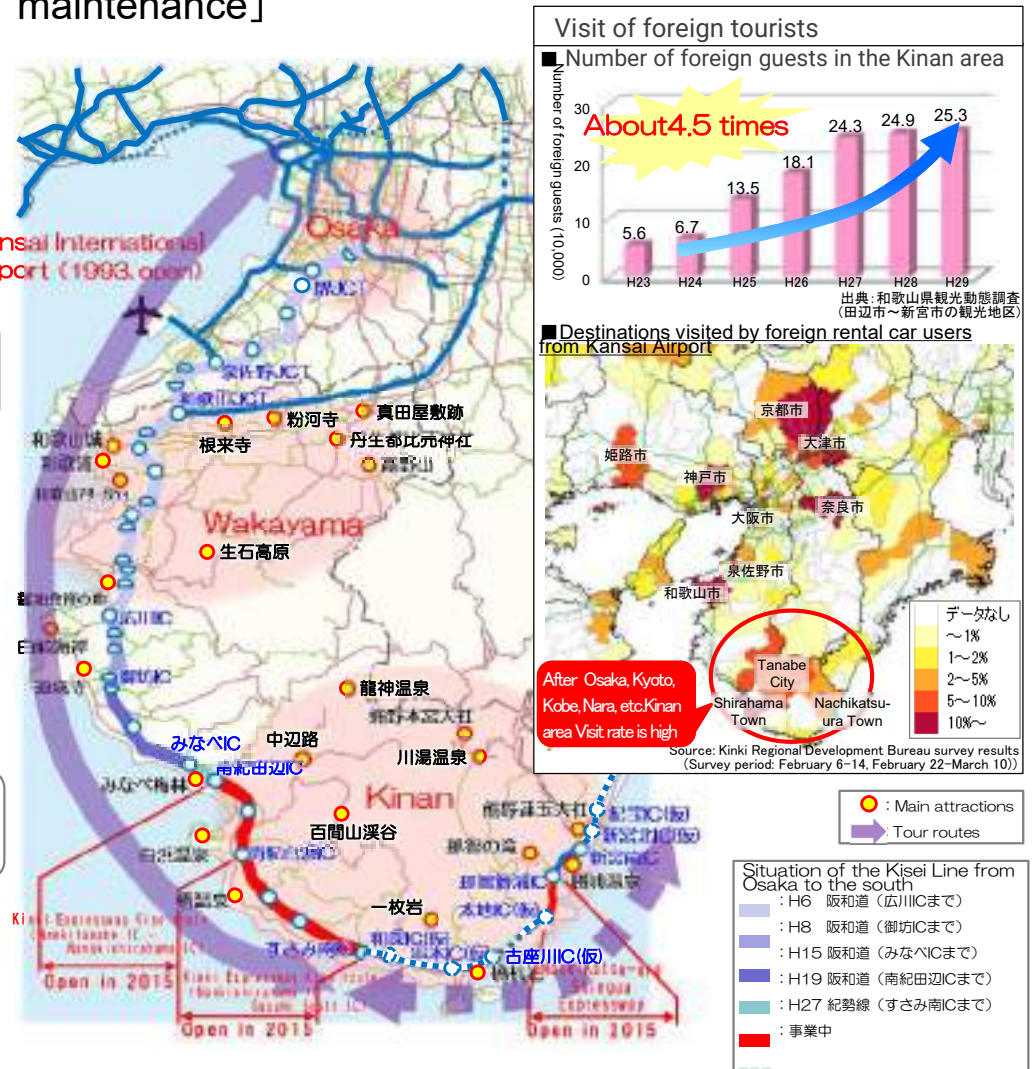
Stock effect ③: Example of creating wide-area tourism routes

- After the construction of the Trans-Shikoku Expressway, the number of cruise ships and foreign tourists increased due to improved accessibility to the Port of Uwajima.
- With the extension of the Trans-Shikoku Expressway, further expansion of inbound tourism is expected.
- The number of foreign overnight guests in the Kinan area is on the rise due to improved accessibility to Kansai International Airport and other areas, thanks to the extension of the Kise Line of the Kinki Expressway.
- The number of foreign tourists is expected to increase further with the extension of the Kinki Expressway Kise Line in the future.

[Regional revitalization through extension of the Trans-Shikoku Expressway]



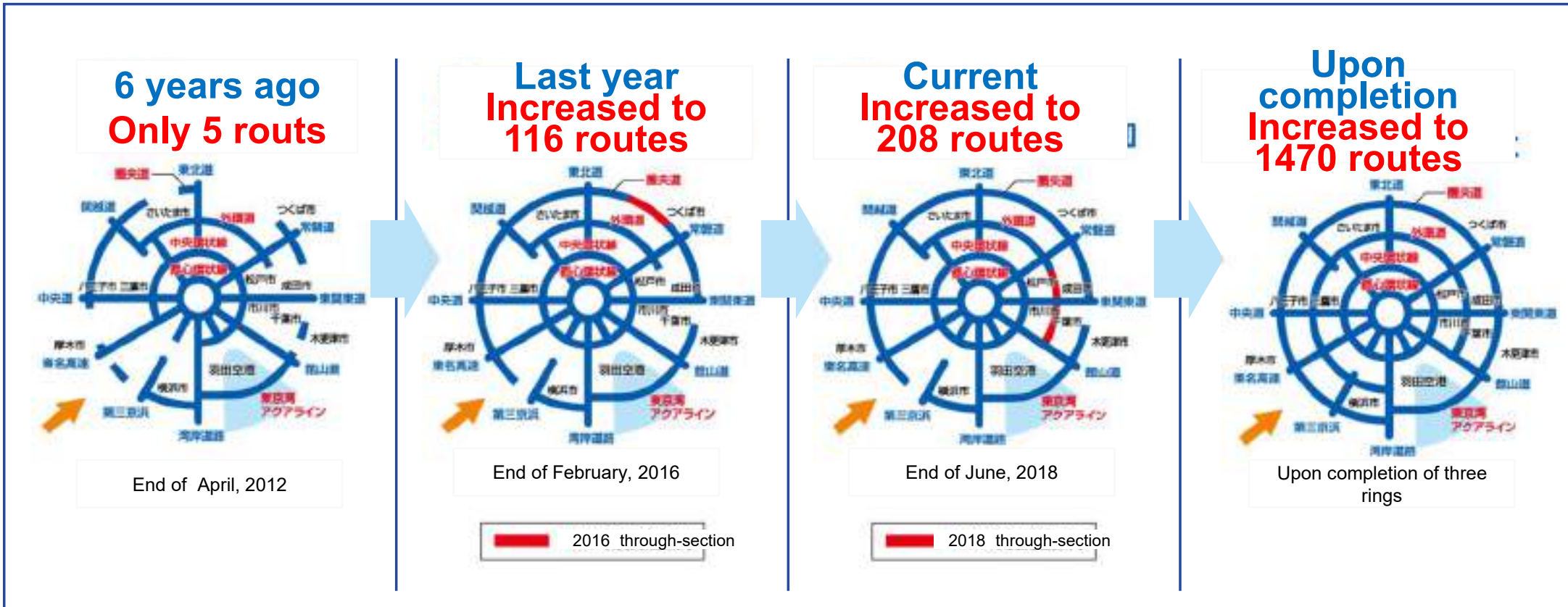
[Effects of the Kinki Expressway Kisei Line extension on maintenance]



Stock effect ④: Example of securing redundancy

- The number of routes from the Tomei Expressway to central Tokyo will increase dramatically with the creation of a network of ring roads (current: 70 routes ⇒ 1,470 routes upon completion of the 3 ring roads)

Route from Tomei Expressway ⇒ Route to central Tokyo



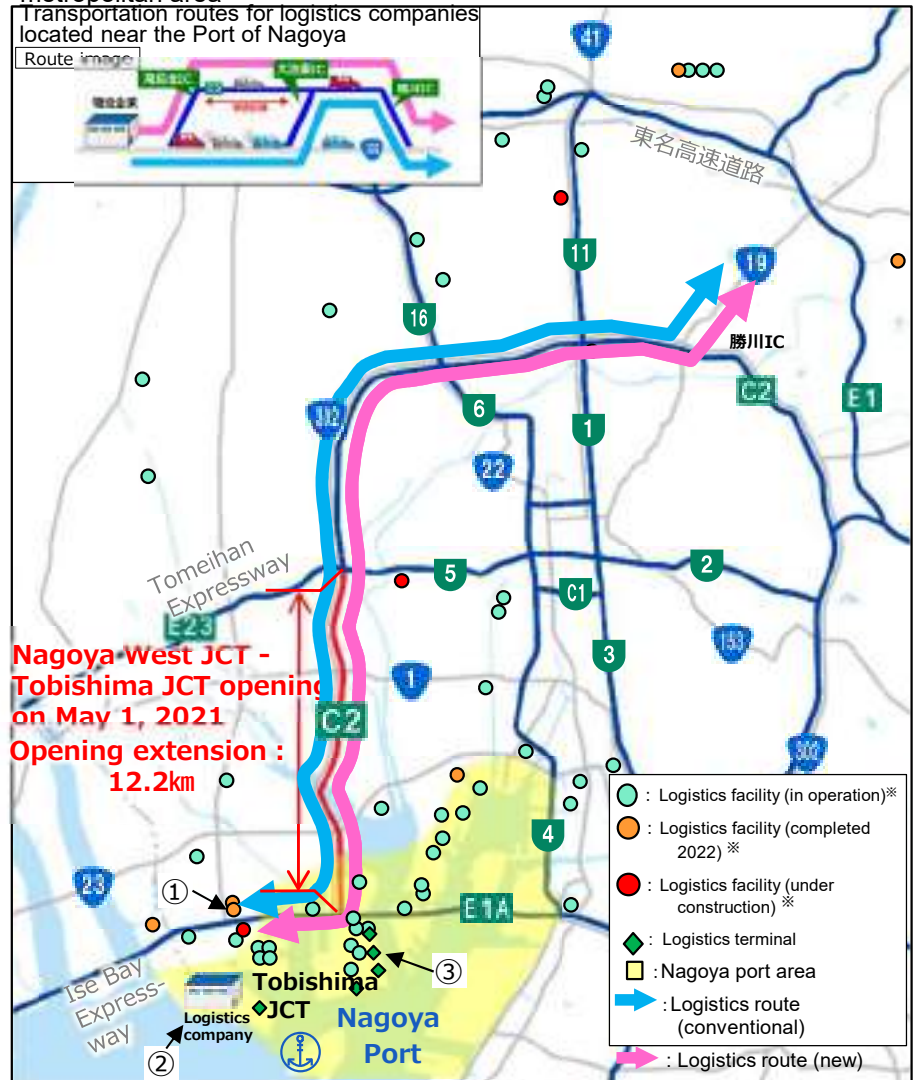
Calculation conditions】 Same conditions as in the "Expert Committee Document on the Examination of Expressways"

- Target routes: Expressways and toll roads
- Starting point: Tomei Expressway: Atsugi IC / Ending point: Central Tokyo Loop Line JCT (Takebashi, Miyakezaka, Hamacho, Hamasaki Bridge, Edobashi, Hakozaki)
- Do not pass JCT twice on the same route
- JCT regulations are as per regulations.
- Radial roads should only be used in the upward direction, not in the downward direction (do not go to the outer ring road)
- Route 1 Yokohane Line and Wangan Line Kanagawa are consolidated.

Stock effect ⑤: Effects of the Nagoya Loop Route 2 Improvement

- Nagoya Nishi - Tobishima section opened to traffic on May 1, 2021, bringing the half-century-long Nagoya Loop Route 2 project to full service.
- The opening of Nagoya Loop Route 2 (Mei-Ni-Kan: Nagoya-Nishi JCT to Tobishima JCT) shortened the transportation time between Tobishima Pier and Kachigawa IC by approximately 21 minutes, contributing to the reduction of truck drivers' working hours.
- In the Port of Nagoya, which is directly connected to the Meiji Ring Line, the volume of container cargo handled has tripled in about 30 years, and the development of container terminals has been promoted, and the number of logistics facilities located along the Mei-Ni-Kan has increased 4.8 times in about 20 years.

Location status of logistics facilities of major operators in the Nagoya metropolitan area



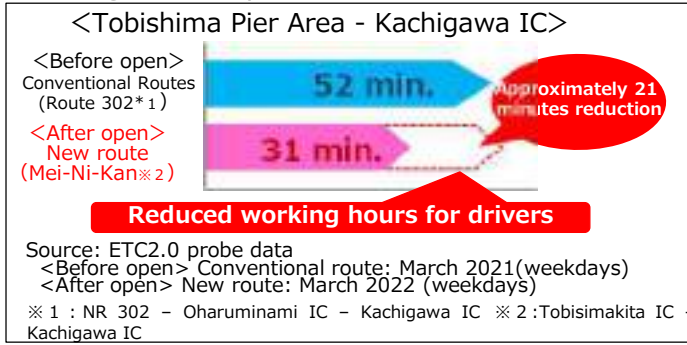
Example: Location of a large logistics facility



In response to demand for multi-tenant logistics facilities in the Tokai region centered on Aichi Prefecture, a new logistics center in Yatomi City, the largest in the Tokai and Hokuriku regions, operates 24 hours a day.

Provided by: Logistics facility operators

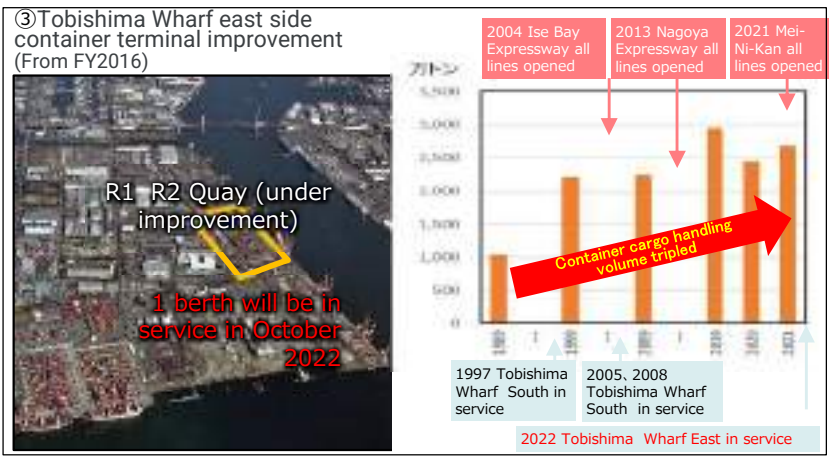
Change in transport time



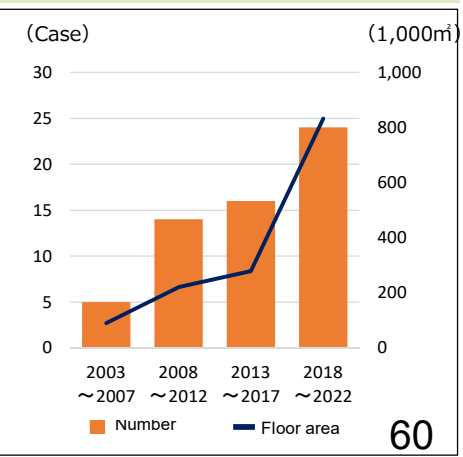
② Corporate Voices

- Source: Results of hearing survey on August 2021
- The opening of the Mei-Ni-Kan has shortened the time, contributing to a reduction in working hours for drivers.
 - In addition, after the opening of the Mei-Ni-Kan, more route options became available, enabling transportation while judging traffic conditions.

Tobishima Wharf container terminal development status, cargo handling volume trends, and major expressway opening status



Logistics facility location status in Nagoya City, Yatomi City, and Tobishima Village



- In cities along the railway line, corporate tax revenues are higher than the growth rate of Osaka Prefecture as a whole.

出典:各自治体統計資料

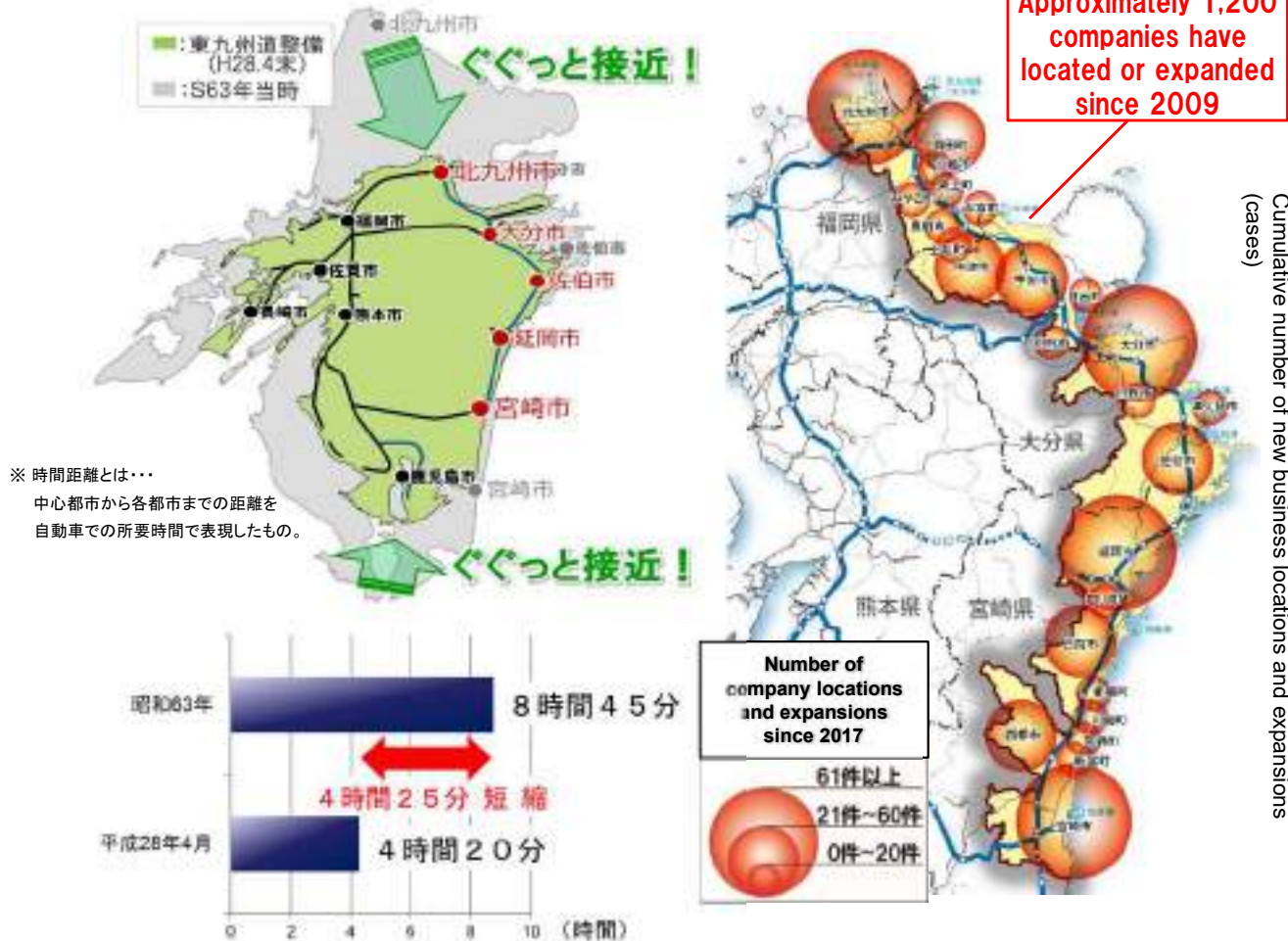
凡 例

- 第二京阪道路
(平成17年3月30日開通区間)
- 第二京阪道路
(平成22年3月30日開通区間)
- 高速道路(路線は事業中)
- その他道路
- 大規模商業施設(014~021開設)
- 大規模商業施設(022以降開設)
- 物流拠点施設(014~021開設)
- 物流拠点施設(022以降開設)
- 第二京阪道路沿線施設(大阪府)
- 第二京阪道路沿線施設(京都府)

出典：大規模商業施設：大阪府、京都府資料
物流拠点：国土交通省資料

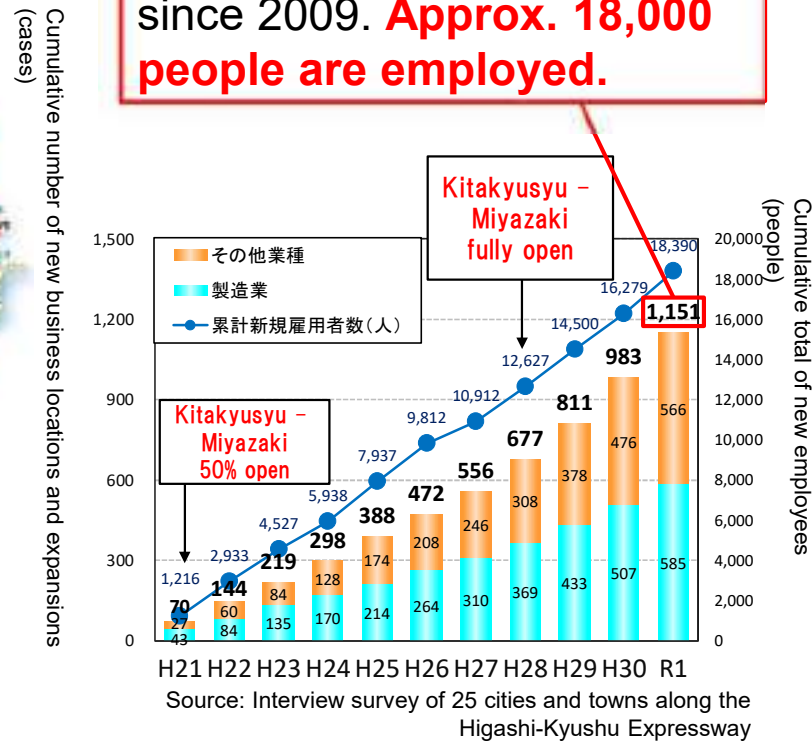
- With the direct connection of the Higashi-Kyushu Expressway from Kitakyushu City to Miyazaki City in April 2016, a circulatory type expressway network has been constructed. Compared to 1988, the travel time from Kitakyushu City to Miyazaki City was reduced by 4 hours and 25 minutes.
- Approximately 1,200 companies have expanded into cities and towns along the Higashi-Kyushu Expressway in the 11 years since 2009. Approximately 18,000 new people are employed, contributing to the revitalization of the local economy.

■ Higashi-Kyushu Expressway directly connects Kitakyushu City to Miyazaki City



■ Number of corporate locations and expansions since 2009

About 1,200 companies have moved into the area since 2009. Approx. 18,000 people are employed.



Contents

1. Overview of Japan
2. Overview of Okinawa Prefecture
3. Policies Concerning Road Planning
4. Policies Concerning Road in Japan
5. Initiatives of Road Construction in Okinawa

4. Policies Concerning Road in Japan

(1) Congestion countermeasures

(2) Traffic safety measures

(3) Road maintenance

(4) i-Construction

(5) Road ITS

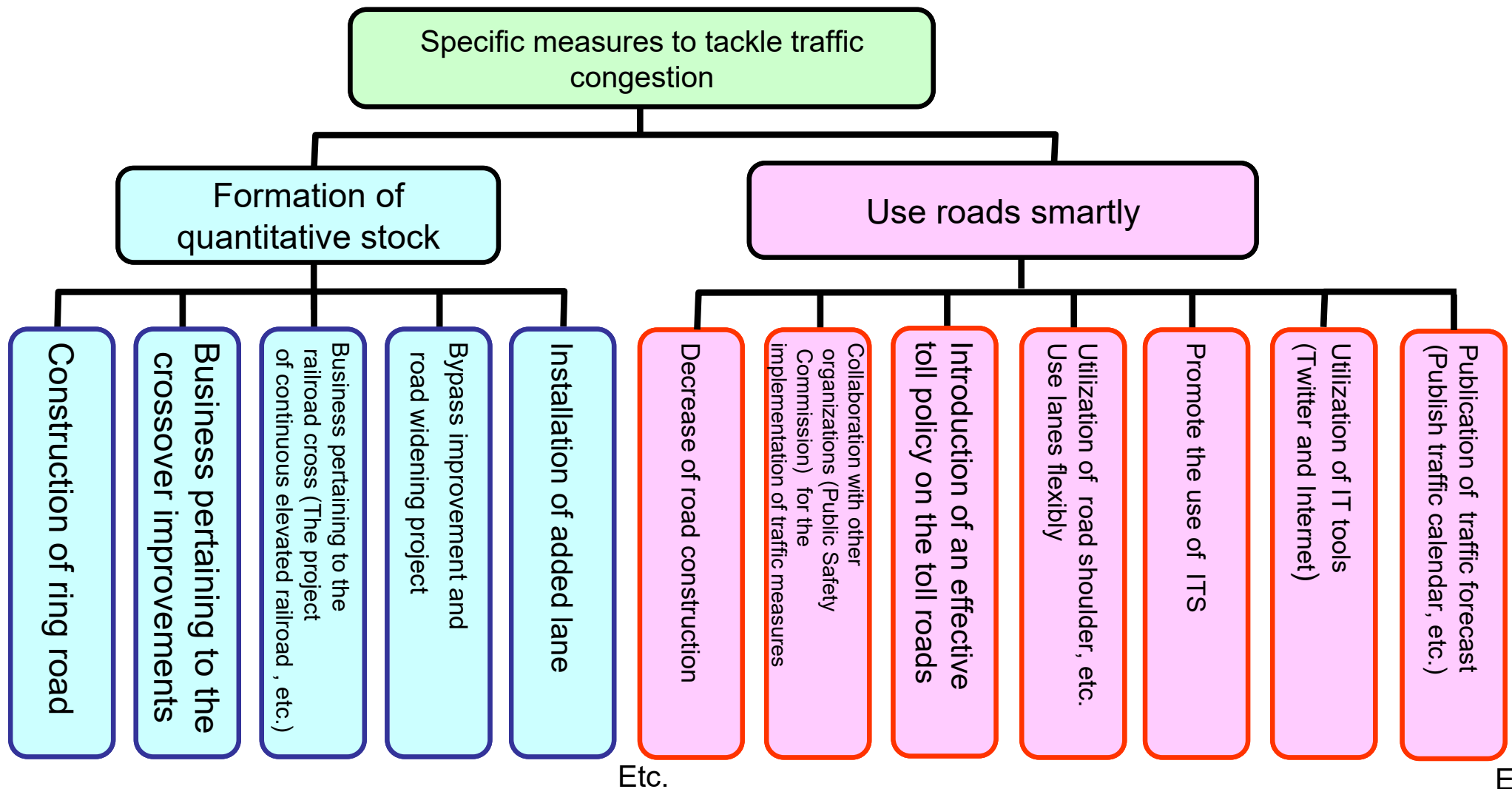
(6) TEC-FORCE

(7) Improving environment for bicycle use

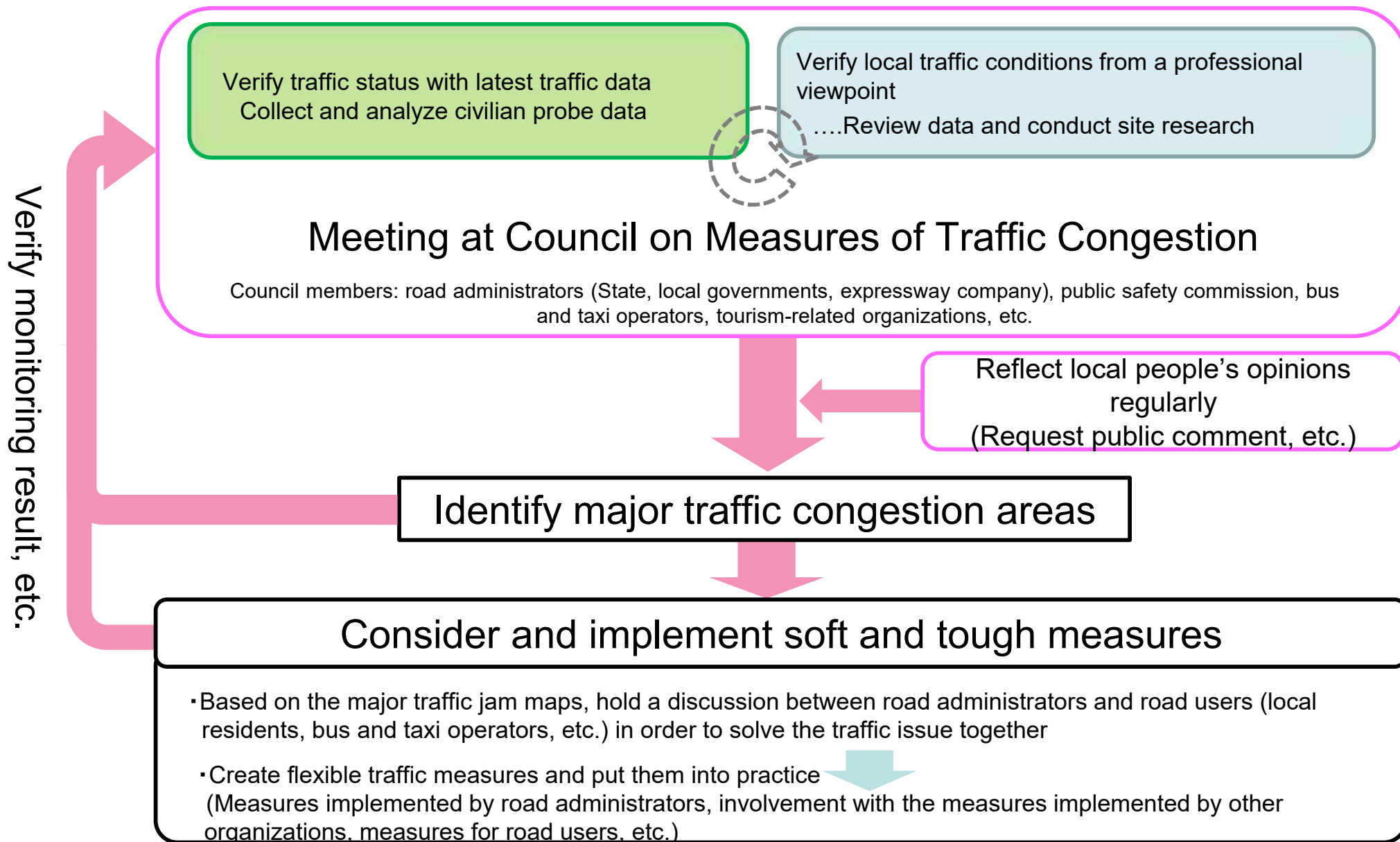
(8) Roadside station

(9) No utility poles

- Conventional measures to tackle traffic congestion were focused on the construction of ring road and bypass, the installation of three-dimensional crossing section, the enhancement of traffic capacity (by solving the traffic problems, ex: grade level crossing whose gates always seem to be closed) and intensive countermeasures against critical congestion areas (formation of quantitative stock).
- In recent years, in order to meet the needs of a diversified road users, the method “ Smart Use of Roads” has been applied as one of the measures to tackle traffic jam, in addition to the formation of quantitative stock.



- Based on the current traffic data focusing on major congestion locations, traffic measures are examined and performed.
- Each year, major congestion locations will be monitored according to the following management cycle, and a measure review will be conducted accordingly.



4. Policies Concerning Road in Japan

(1) Congestion countermeasures

(2) Traffic safety measures

(3) Road maintenance

(4) i-Construction

(5) Road ITS

(6) TEC-FORCE

(7) Improving environment for bicycle use

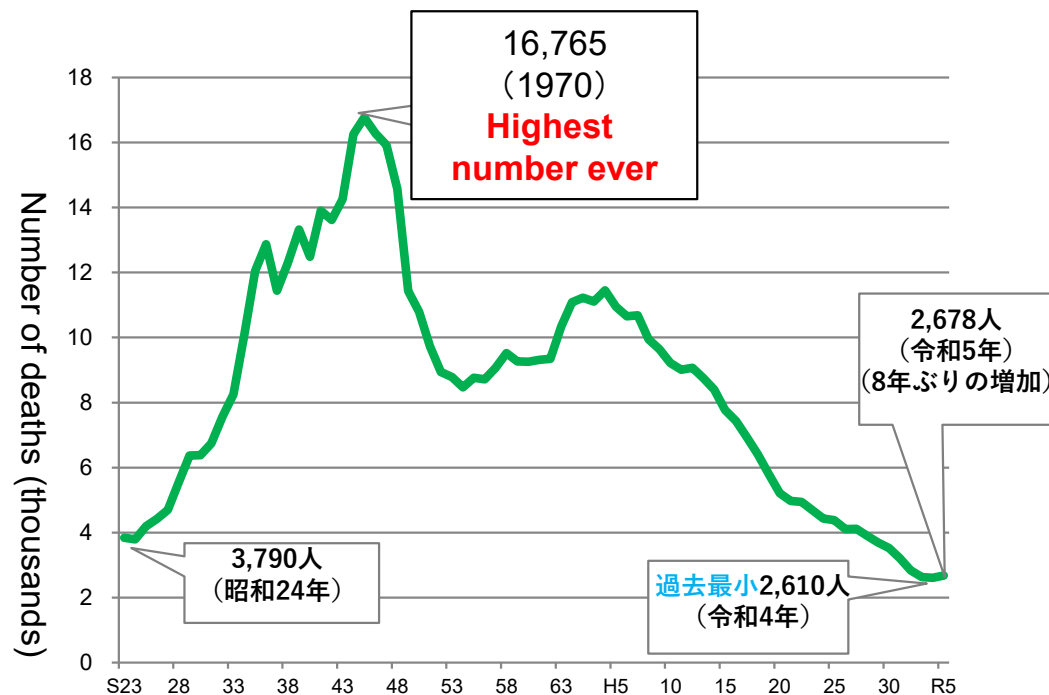
(8) Roadside station

(9) No utility poles

Current status of traffic accident fatalities

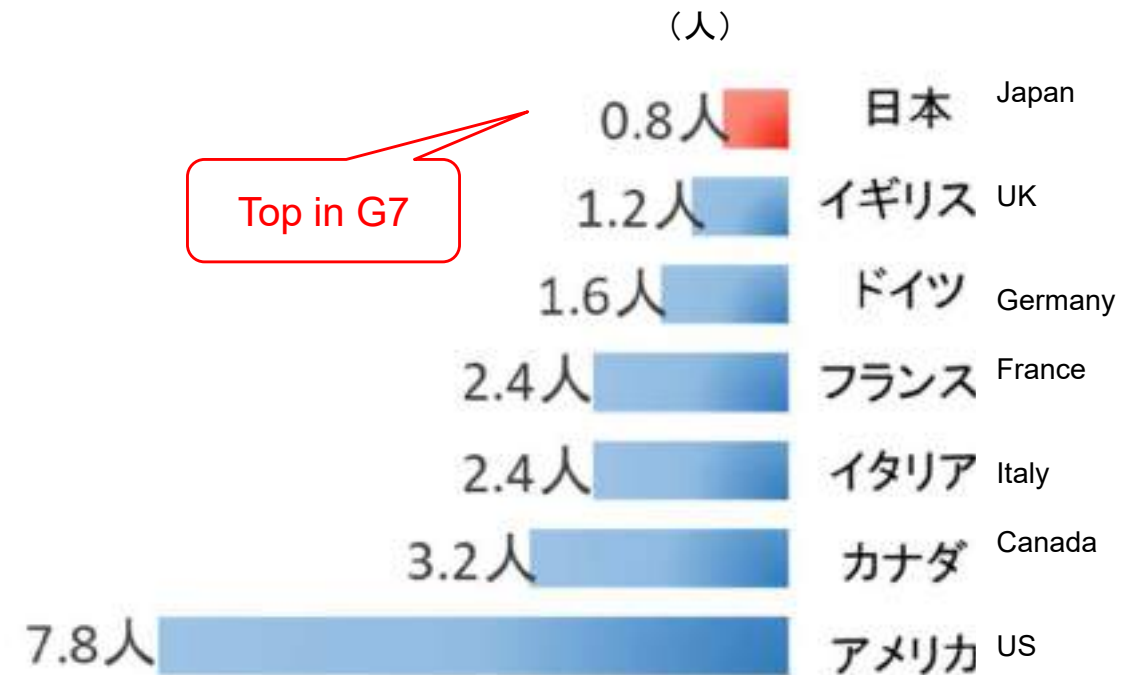
- The number of fatalities from traffic accidents had been on a downward trend, but increased slightly in 2023.
- The number of automobile fatalities per 100,000 people is the lowest among developed countries.

Changes in number of traffic fatalities



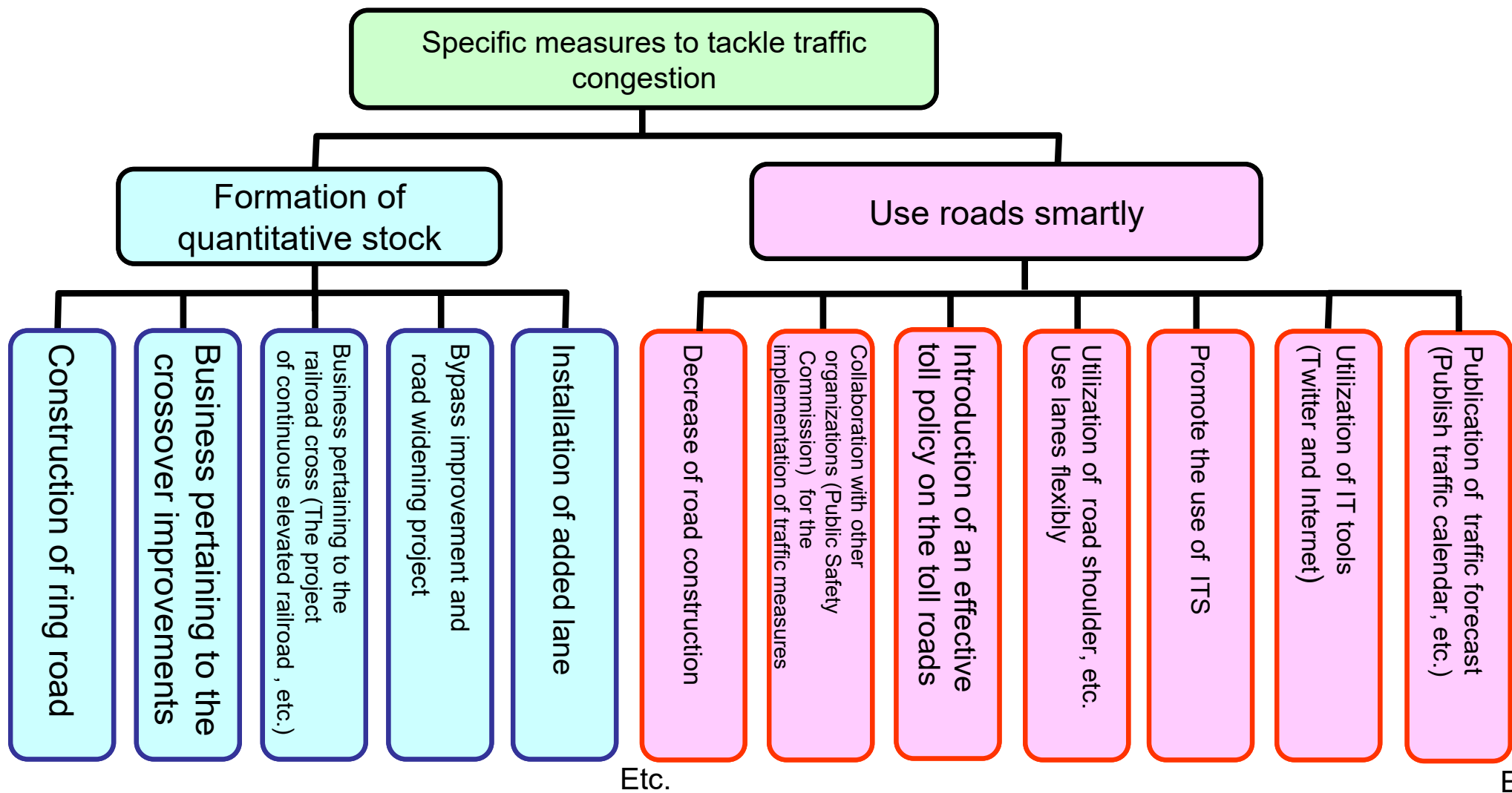
Source: Based on the National Police Agency Traffic Bureau's "Number of Traffic Accident Fatalities in 2022"

Number of deaths per 100,000 people



Source: IRTAD (2021) World Bank *2020 data for the U.S. only

- Conventional measures to tackle traffic congestion were focused on the construction of ring road and bypass, the installation of three-dimensional crossing section, the enhancement of traffic capacity (by solving the traffic problems, ex: grade level crossing whose gates always seem to be closed) and intensive countermeasures against critical congestion areas (formation of quantitative stock).
- In recent years, in order to meet the needs of a diversified road users, the method “ Smart Use of Roads” has been applied as one of the measures to tackle traffic jam, in addition to the formation of quantitative stock.



Intersection improvement

【Before measures】



Accidents occurred when turning right and rear-end collisions due to sudden lane changes.

Right turn lane extension + separation from straight lane

【After measures】



Additional lanes

【Before measures】



Traffic jams occur during morning and evening commutes, resulting in many rear-end collisions between vehicles and accidents when turning right.

Additional lanes

【After measures】



Installation of central strip/crossing prevention fence

【Before measures】



Lined with roadside facilities, there is a risk of human-vehicle accidents due to disorderly pedestrian crossing

Central belt + fence to prevent disorderly crossing

【After measures】



Right turn lane extension + colored pavement

【Before measures】



Lack of right-turn retention zones and abrupt lane changes cause many rear-end collisions and accidents when changing lanes

Right turn lane extension + colored pavement

【After measures】



Colored pavement to clarify the path forward

Extend right-turn lanes and retention zone

Attention warnings (road markings)

【Before measures】



When entering and exiting inflow roads and stores, there are many accidents in which vehicles parked in front of the vehicle collide from behind

Road markings for caution ahead

【After measures】



Road surface markings for caution ahead

Attention warnings (signboards)

【Before measures】



Frequent rear-end collisions between vehicles turning right and vehicles going straight

Installation of warning signs

【After measures】

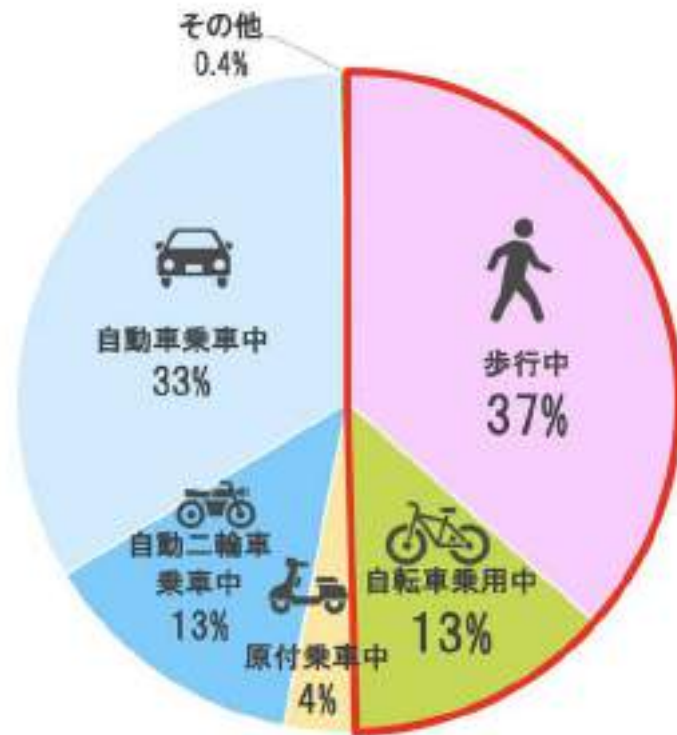


Caution signboard (beware of right-turning vehicles)

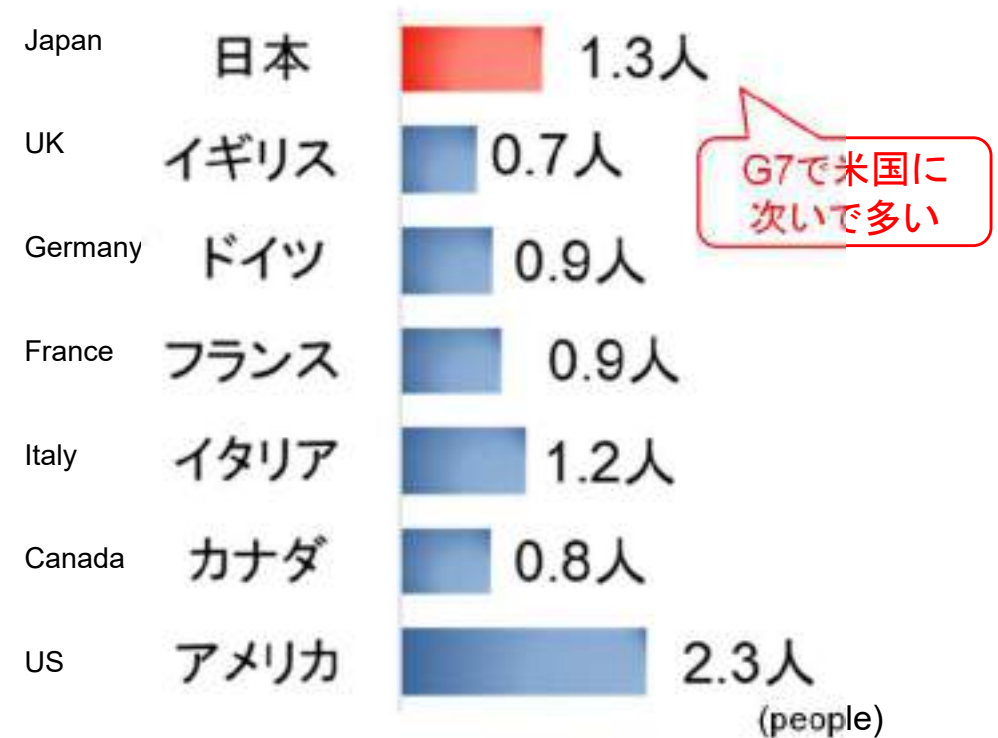
Death toll of pedestrians and cyclists

- The death rate of pedestrians and cyclists accounts for 50%.
- The number of pedestrian and bicyclist fatalities per population is second only to that of the United States.

◆ Death toll by situation



◆ Death toll per 100,000 people (pedestrians and cyclists)



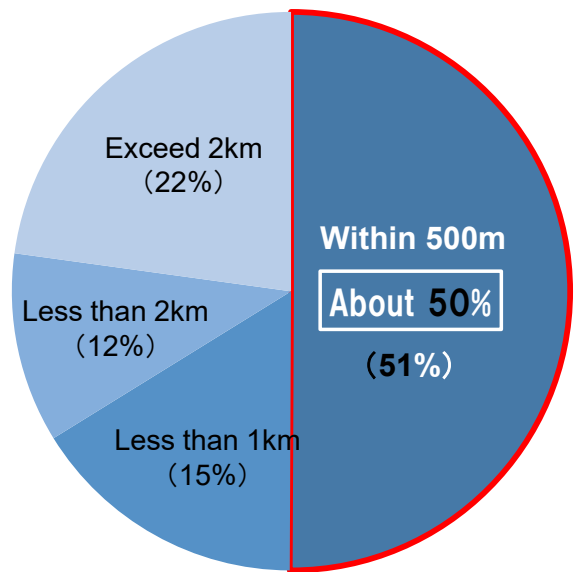
Source: Created based on the National Police Agency Traffic Bureau's "Characteristics of Traffic Fatalities in 2022"

Source: IRTAD (2021) World Bank *2020 data for the U.S. only

Accidents occurred on familiar roads in the neighborhood

- About half of the pedestrians and cyclists' victims got killed in traffic accidents in the area within 500m from their domiciles.
- The percentage of the death toll in the urban area in Japan is the lowest among developed countries.

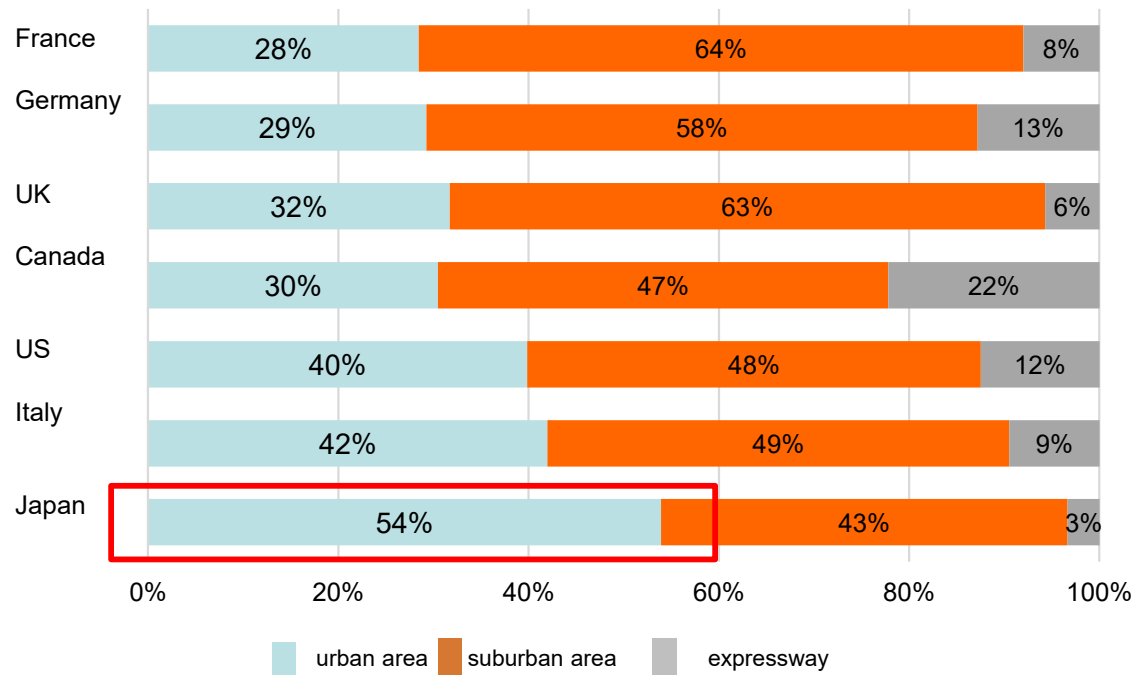
◆Fatal accidents occurred on the way to and from home by distance (pedestrians and cvclists) (2016)



N=1,870

Source: created based on the published data (2016) of National Police Agency

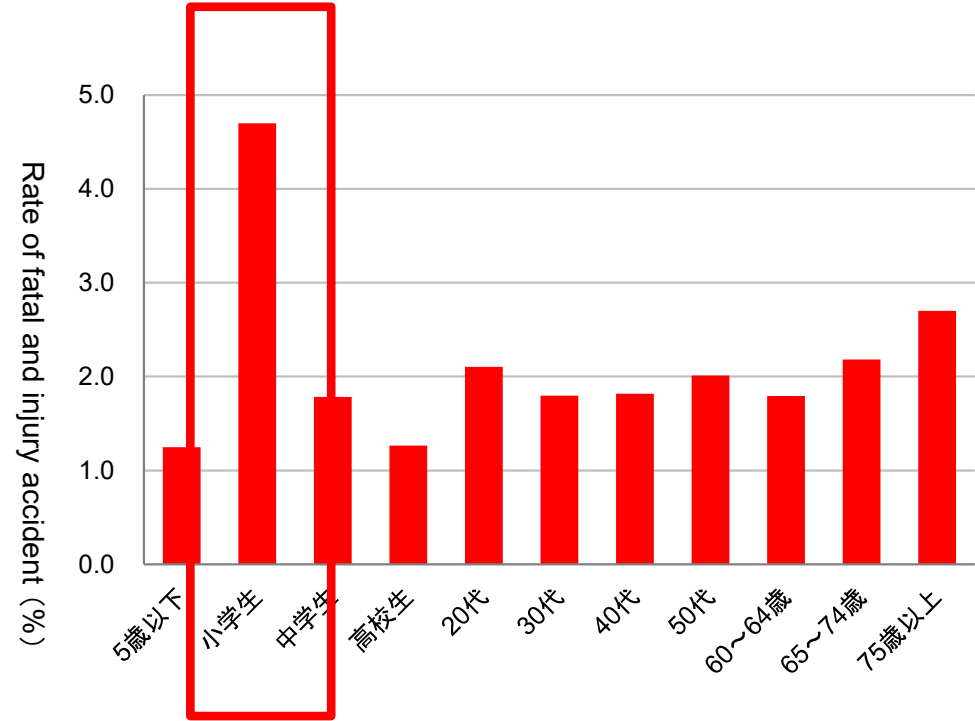
◆ The percentage of traffic fatalities by location (overall death toll)



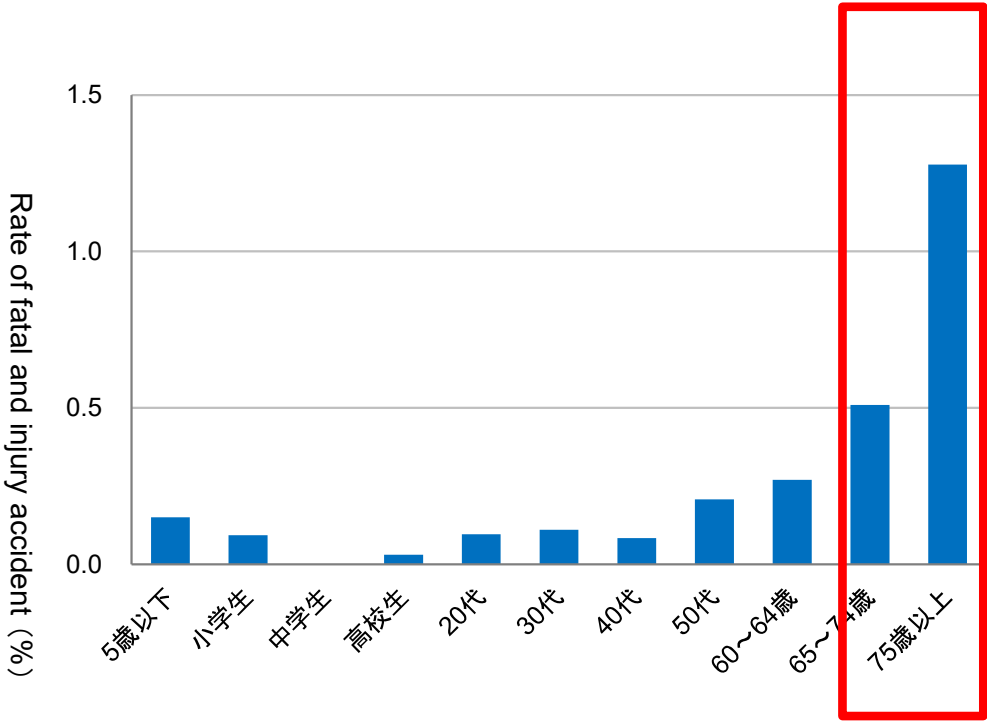
Created based on IRTAD data (death within 30 days)
* Death tolls by country in 2013 (only the figure of Canada is from 2012)

○ Among traffic accidents per population on residential streets, there is a high probability of casualty accident experienced by elementary school students, and that of fatal accidents experienced by elderly people aged 75 and over; i.e. children and elderly have higher traffic accident rate than the other population.

■ Number of casualty accident cases by age per capita



■ Number of fatal accident cases by age per 1,000 population



Source: Institute for Traffic Accident Research and Data Analysis (data of 2016 from ITARDA)

1981

Maintenance of community roads (benefited from the aid) (since 1981)

The goal is to reduce traffic volume on residential streets and create a comfortable living environment, we set up speed limit in order to prevent traffic accidents from happening, and maintained roads to ensure a safe and secure walking space for pedestrians

Comprehensive Traffic Safety Model Project in Residential Areas (Load Pier Project) (since 1984)

Maintain the pavement of community roads

1984

1996

Community zone formation project (since 1996)

Together with the speed limit by the Public Safety Commission, road administrator also maintained the pavement of community roads, etc.

2001

Amendment of Road Construction Ordinance (2001)

Decide the location of road hump and narrowing street, etc. (Article 31-2)

2003

Maintenance of safe walkway area (2003-2007)

Together with the speed limit, etc. enforced by Public Safety Commission, comprehensive measures on pedestrian priority such as the installation of sidewalks are conducted. Designated 796 areas

2008

2009

Maintenance of safe walkway area (2008-2012)

Designated 582 areas

2011

2012

Emergency joint inspection of school-commuting roads (2012-)

The MLIT, the MEXT and the National Police Agency conduct emergency joint inspection and measures jointly to ensure traffic safety in school-commuting roads.

2016

Formulation of technical criteria concerning the installation of road hump, road narrowing and road bend section (2015)

Traffic safety measures on residential street areas (2016-)

Carry out scientific measures by utilizing big data to identify in advance risky zones

2019

Joint inspection of routes, etc. along which preschool children travel in groups on a daily basis (2019-) Joint inspections by MHLW, MLIT, National Police Agency, etc. → implementation of countermeasures

2021

Joint inspection of school routes (2021-) Joint inspection by MEXT, MLIT, and NPA → implementation of countermeasures

Revision of Traffic Regulation Standards (2009)

Maximum speed on residential roads is 30km/h in principle

Maintenance of Zone 30 (2011-)

• Maintenance of 4,186 locations
(March, 2022)

Maintenance of Zone 30 Plus (2022-) Road administrators and police cooperate to implement traffic safety measures on daily roads [33 locations Maintenance plan already established (July, 2023)]

○ Since April 2012, a series of **traffic accidents involving school children while commuting to and from school** occurred one after another in Kameoka-shi, Kyoto Prefecture, etc.



○ **An emergency joint inspection on school commuting roads** was implemented by road administrators, schools, the board of education, police, PTA, etc.

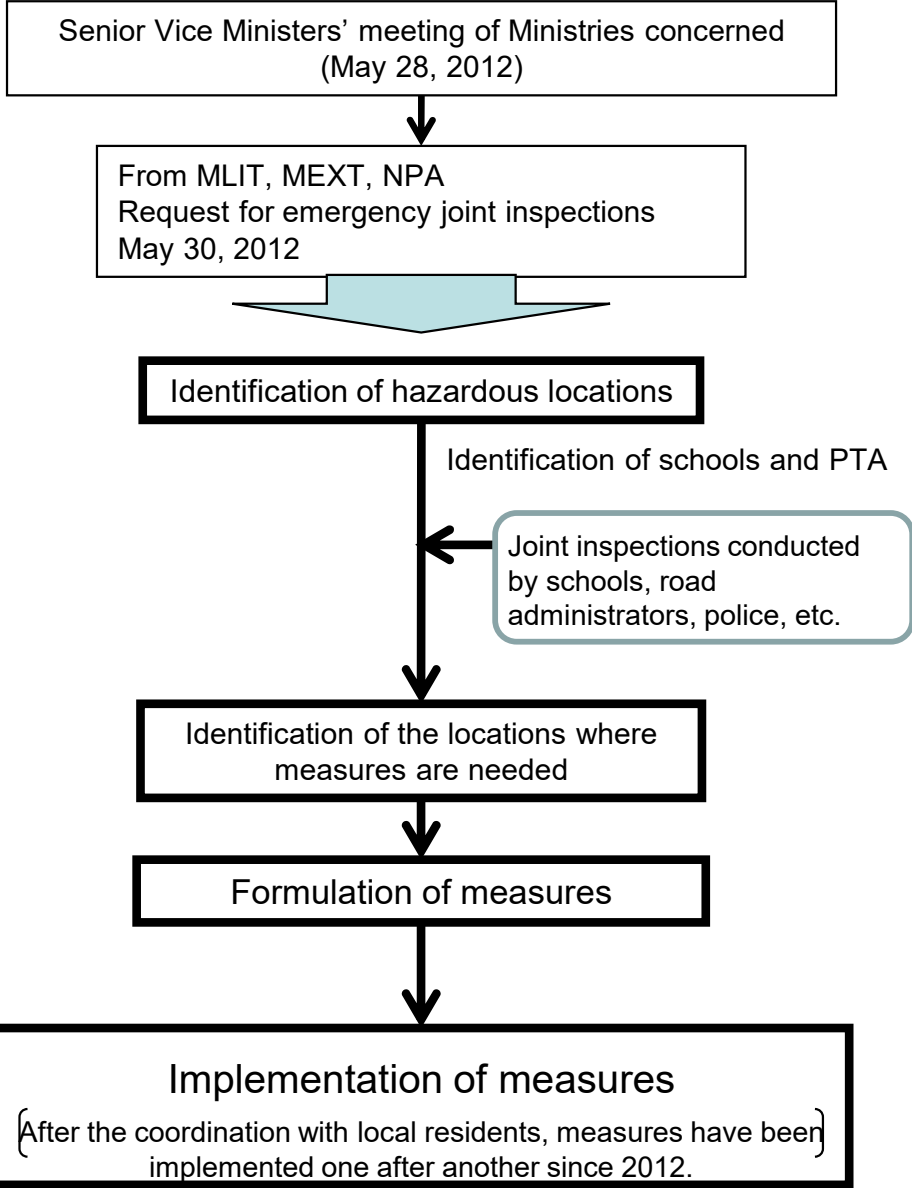
(1) Emergency joint inspection results (as of November 30, 2012)

- Number of schools where emergency joint inspections have been conducted: 20,160 schools
- Number of locations where emergency joint inspections have been conducted: 80,161 locations
- Number of locations where measures are needed: 74,483 locations

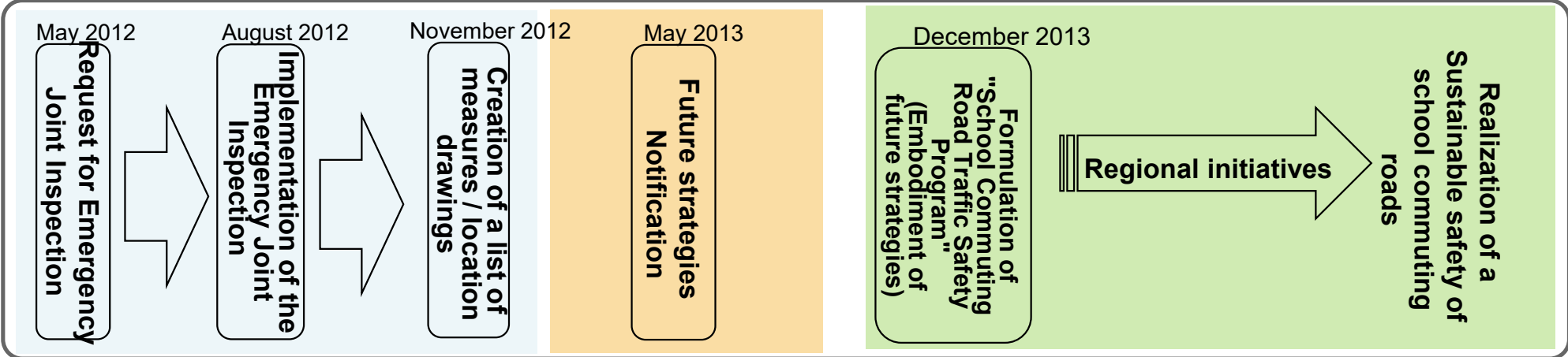
② Breakdown of the locations where measures are needed and status (as of the end of 2015)

- Number of the locations where measures are needed: 74,483 locations (Of which, measures have been implemented in 68,931 locations.)
 - Measures by road administrators: 45,060 locations (Of which, measures have been implemented in 40,793 locations.)
 - Measures by schools: 29,588 locations (Of which, measures have been implemented in 29,410 locations.)
 - Measures by the police: 19,715 locations (Of which, measures have been implemented in 19,479 locations.)

《Implementation flow of emergency joint inspections on school commuting roads》



○ In order to secure a sustainable safety of school commuting roads, each municipality has set up their own "traffic safety program for school commuting roads".

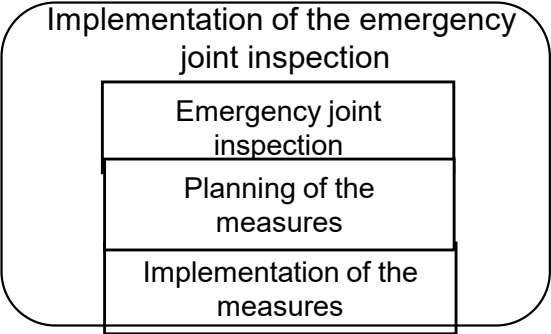


May 2012
Request from the State (Nationwide simultaneous inspection)

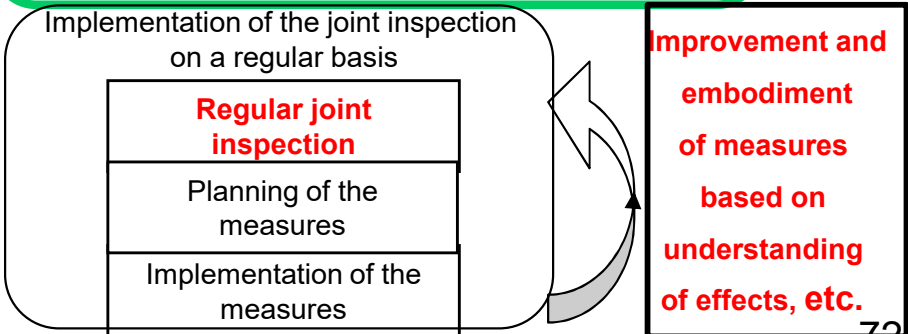
May 2013
Ongoing activities Notification

December 2013
Formulation of the traffic safety program for school commuting roads Notification

- “Program content” ※ Created by each municipality
- ① Set up a system to promote the program
 - ② Periodically conduct joint Inspection
 - ③ Improve and embody measures based on the understanding of the effects, etc.

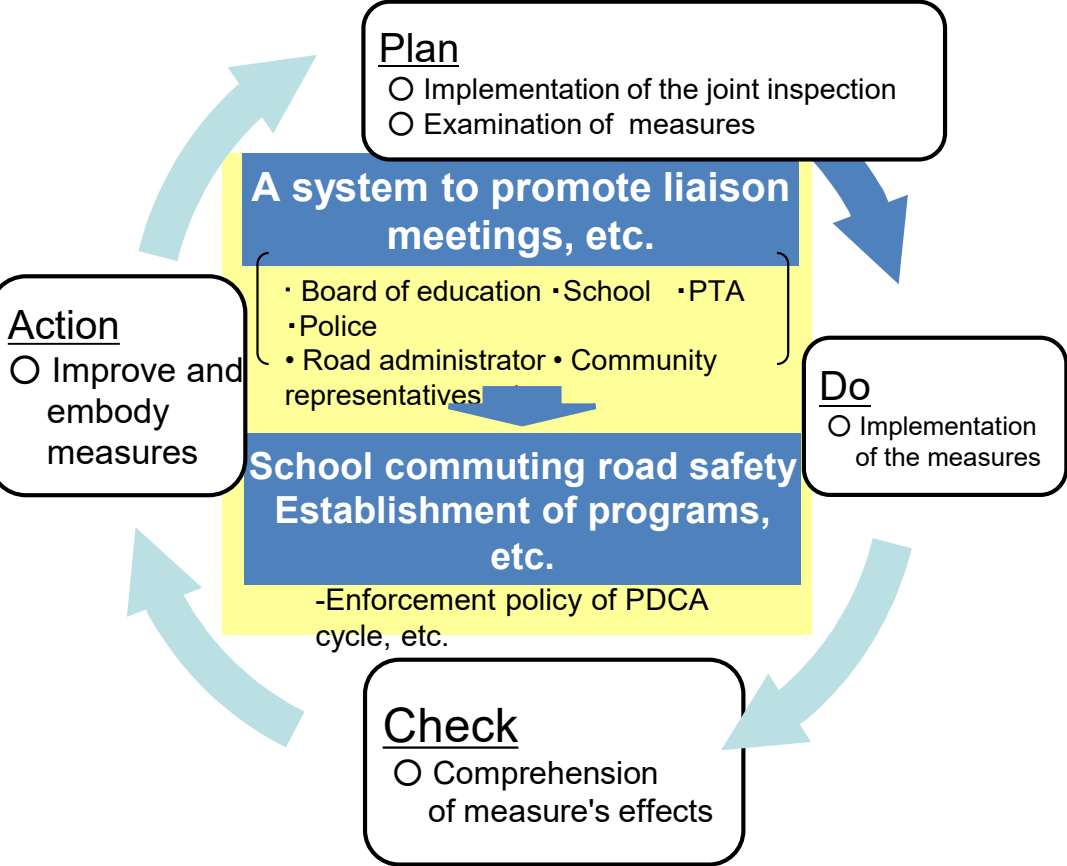


- Implementation of joint inspection, etc.
- Promotion of the ongoing activities
- Establishment of promotion system



- The Board of Education and PTA along with other parties across the country have been conducting joint inspections, studying and implementing safety measures together. A series of improvements have been done based on the results, and the safety measures of school commuting roads are continuously going on.

[PDCA cycle to ensure the safety of school commuting roads]



[Examples of measures implemented in Hamamatsu-Shi, Shizuoka]

- The parties concerned have created an annual schedule of the PDCA (Plan Do Check Act) cycle, clarified the contents, timing, etc. of the ongoing activities to ensure the safety of school commuting roads.



○ Use big data to ensure the safety of residential streets - from stopgap measures to scientific preventive measures -

[The circumstances of traffic accidents]

■ In G7 countries, the safest way to go on a road is driving. **Pedestrian and cyclist rank at the bottom of road safety in G7 countries.**

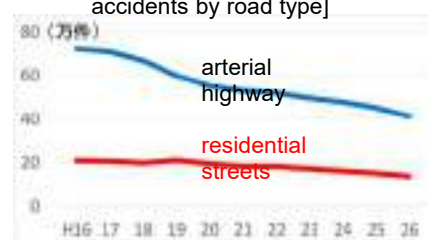
[Comparison of traffic fatalities per 100,000 population]

Country	Driving	While walking	While cycling
Japan	1.3	2.1	2.1
UK	1.4	0.9	0.9
Germany	2.4	1.1	1.1
Italy	3.1	1.4	1.4
France	3.4	1.0	1.0
Canada	4.2	1.1	1.1
USA	7.4	1.8	1.8

Source) OECD/ITF (2014) Road Safety Annual Report 2014

■ The number of accidents on **residential streets is not declining as much as that on arterial roads.**


[Trends in the number of traffic accidents by road type]



Source) Road Traffic Accident Statistics Annual Report in Japan

■ **Approximately half** of the accidents **occurred within 500 meters** from home.


【Number of traffic fatalities by distance from home (pedestrian/bicycle)】



Source) Traffic accident data (ITARDA: data of 2014) except for survey failure

■ If the collision speed **exceeds 30 km/h, the fatality rate goes up precipitously.**

< Fatality rate of traffic accident on residential streets by speed >

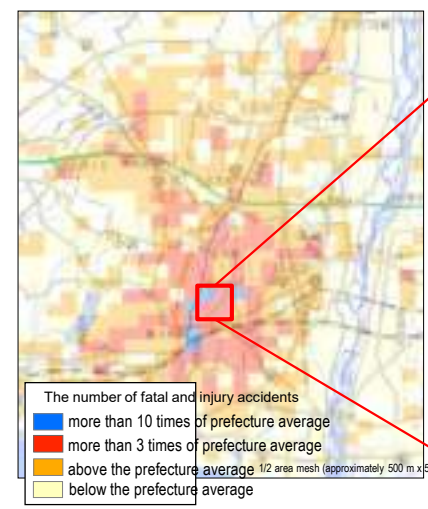


Source) Traffic accident data (ITARDA: data of 2013)

Implement the measures starting with about **100** areas across the country since 2016

< Extraction based on the accident data >

■ Utilize the accident data, pinpoint candidate areas of the measures.




The number of fatal and injury accidents

- more than 10 times of prefecture average
- more than 3 times of prefecture average
- above the prefecture average
- below the prefecture average

< Utilize big data and implement traffic calming measures on residential streets >

“until now”

■ Implement **stopgap measures** at site of accident.



X: site of traffic accident


Analysis of big data

“from now on”

■ **Identify in advance risky zones where over-speed, frequent emergency braking or secret path may be seen.**

X: site of abrupt slowdown
X: site of traffic accident


Harsh braking, an interval where excessive speed is more than 30 km/h




The percentage for speeding more than 30km/h

- Less than 40%
- Less than 60%
- Less than 80%
- More than 80%

Implement an effective “Example” of the measures

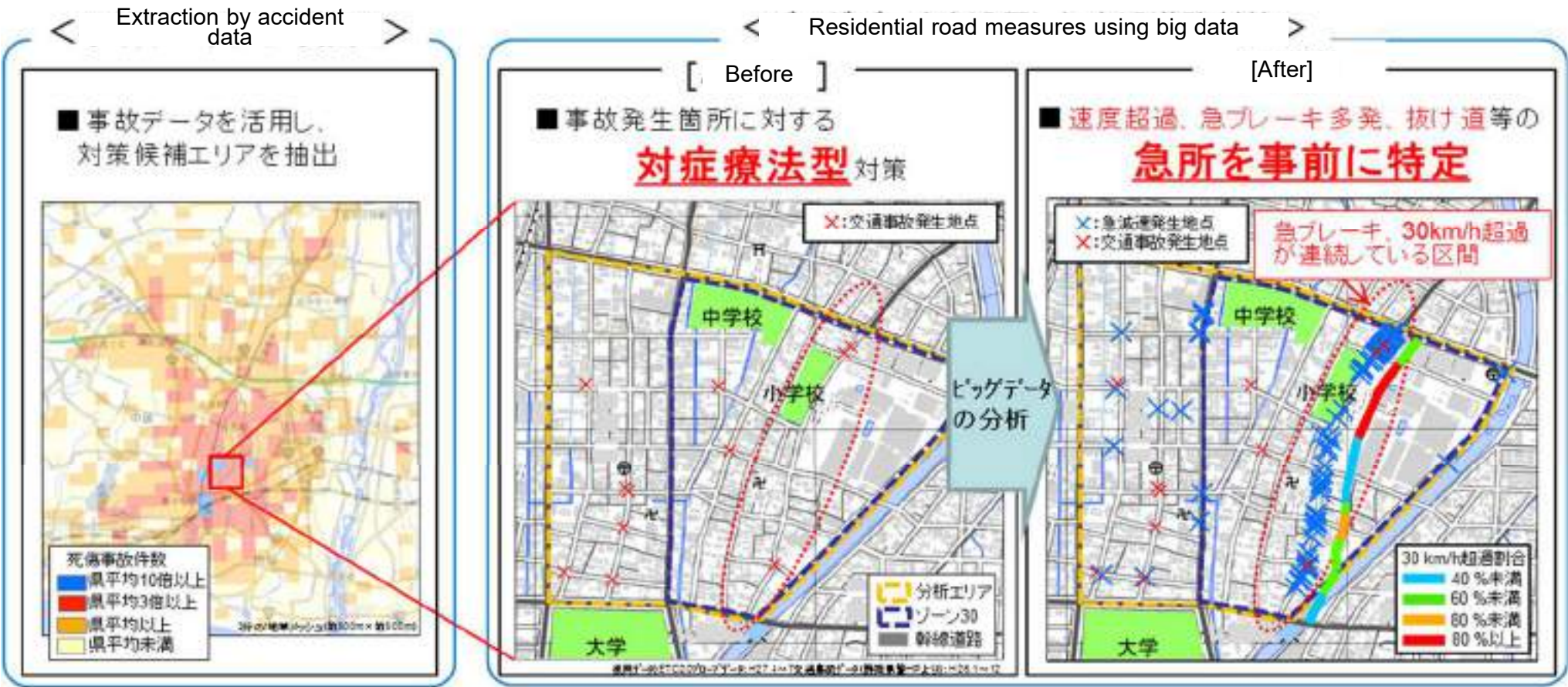


road hump



narrowing street

- Make good use of big data such as ETC2.0 probe information, and identify in advance risky zones on residential streets where over-speed, frequent emergency braking or secret path may be seen, in order to implement an effective measure to tackle the issues.



Images of traffic measures on residential streets

With the collaboration of prefectural and city governments public safety commission, we have taken some effective traffic calming measures for reducing vehicle speeds such as installation of road humps, road narrowing, and etc.; and transforming a residential street from an automobile-centered space into a space for pedestrians and cyclists.

Make it difficult for vehicles to enter a residential street



speed bump



rising bollard

reduce running speed



road hump



narrowing street

- traffic flow reducing measure
- speed-reducing measure
- Measures to ensure pedestrian and cyclist-priority spaces



< Fatality rate of traffic accident on residential streets by speed >



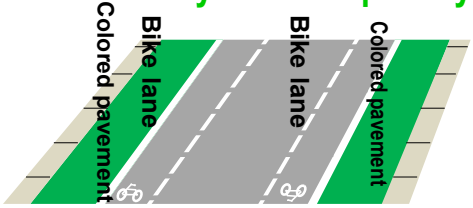
Source) traffic accident data (ITARDA: data of 2013)

Zone 30
(prefectural and city governments public safety commission)

Ensure road width for pedestrian and cyclist with priority



(Kyoto-Fu, Kyoto City)



(Image)

Tackle hazardous locations



Pedestrian and cyclist barrier

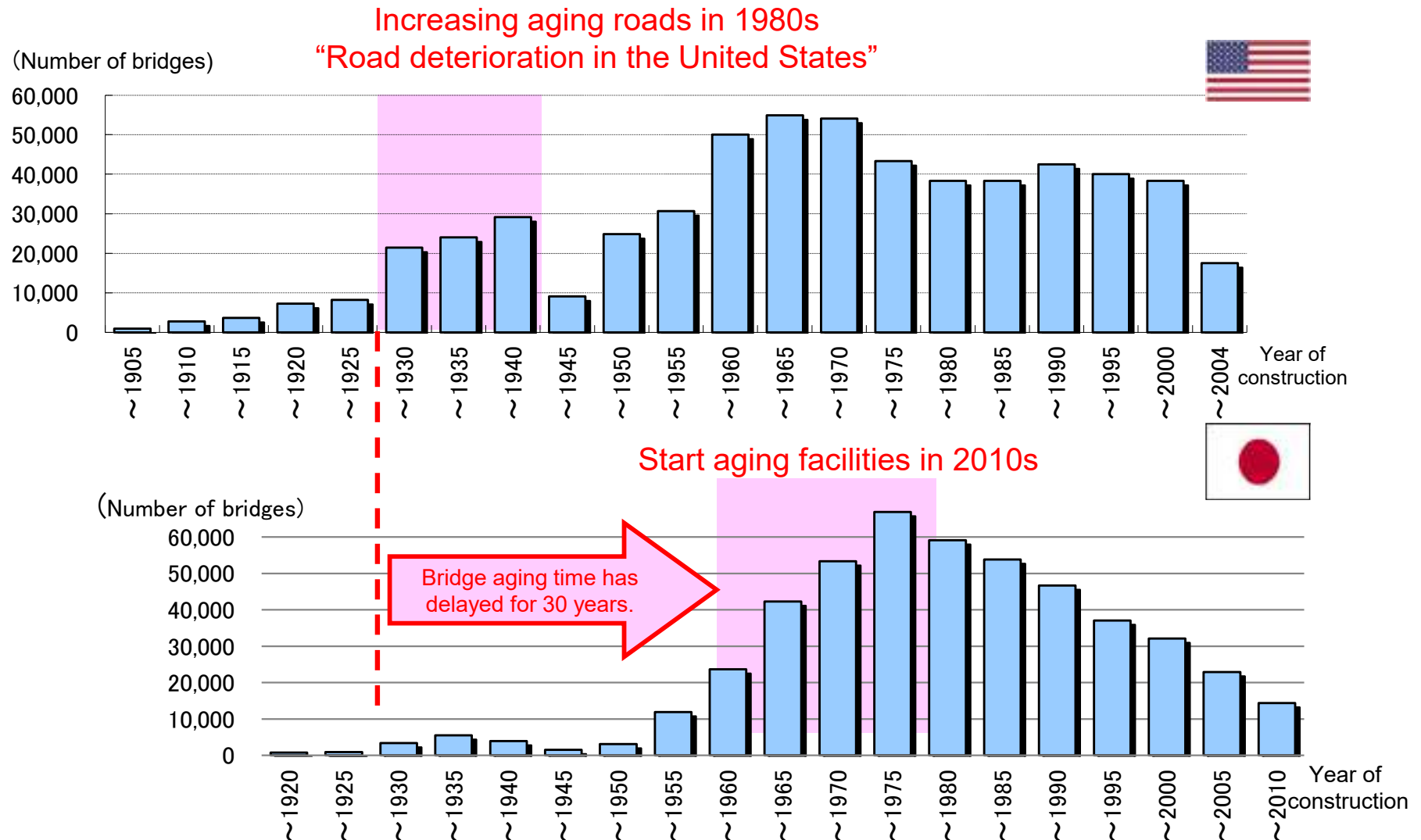


4. Policies Concerning Road in Japan

- (1) Congestion countermeasures
- (2) Traffic safety measures
- (3) Road maintenance
- (4) i-Construction
- (5) Road ITS
- (6) TEC-FORCE
- (7) Improving environment for bicycle use
- (8) Roadside station
- (9) No utility poles

Current condition of stock in Japan

- In the United States many road facilities faced deterioration in 1980s. “Road deterioration in the United States”
- In Japan many road facilities also started aging from the 2010s onward.

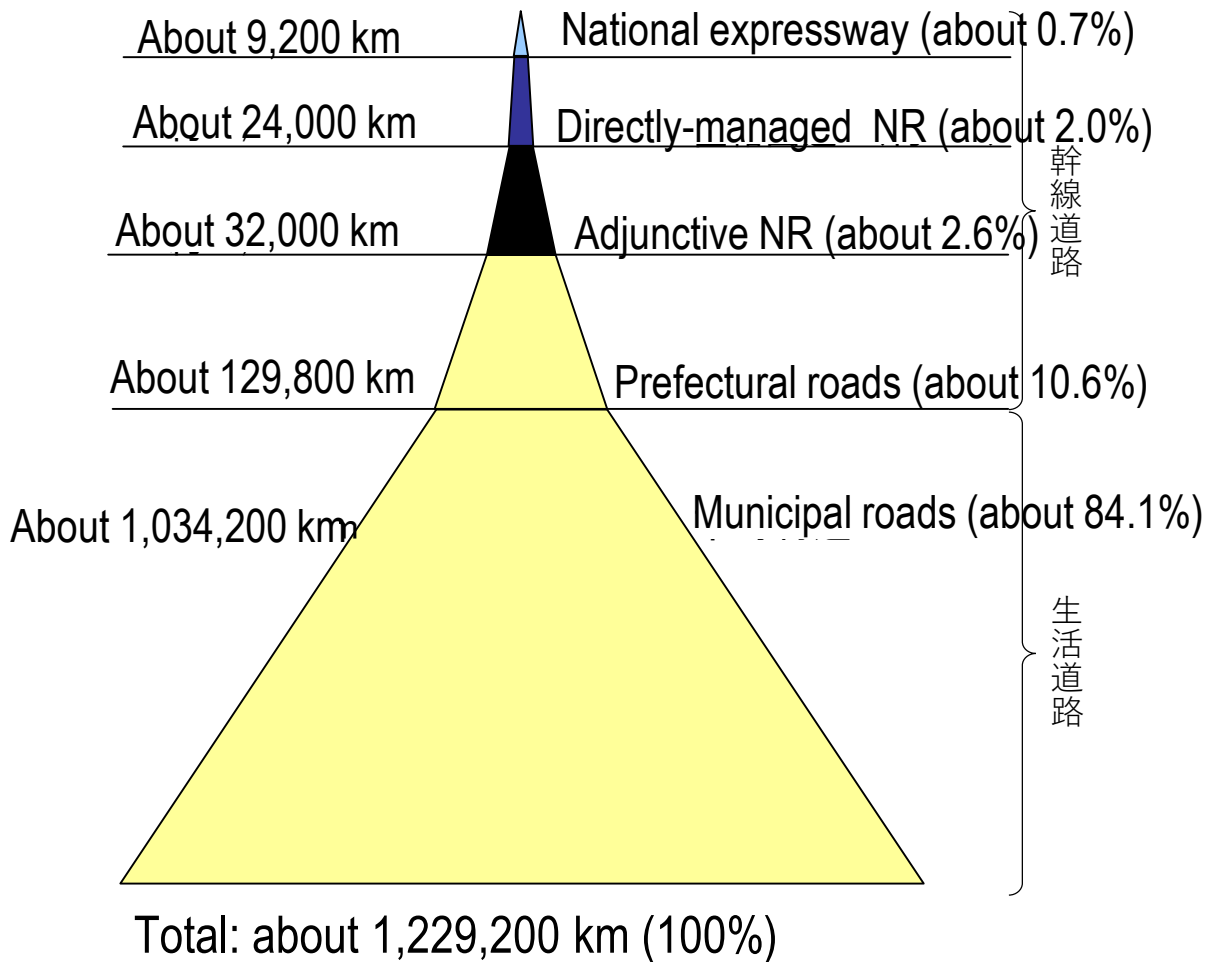


*In addition, the bridges which managed by municipalities are mainly 2m to 15m long, and about 230,000 bridges which were built in unknown years.

Current condition of road stock in Japan

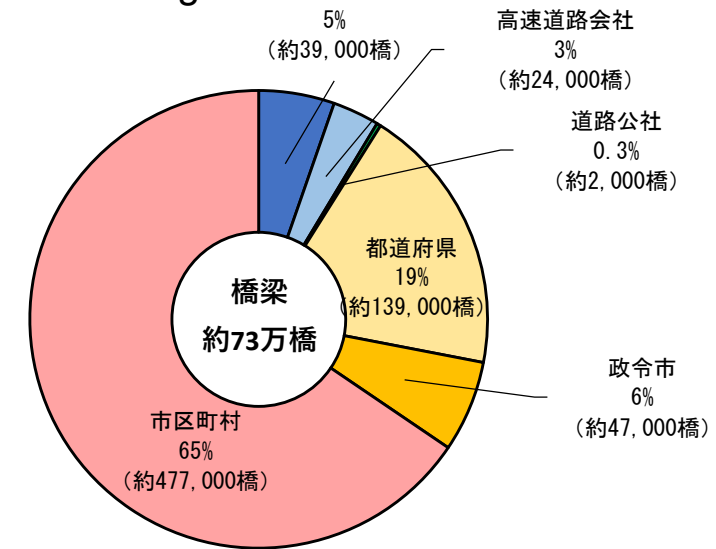
○ In Japan, the road network covers 1.23 million kilometres, there are about 730,000 bridges, and about 12,000 tunnels.

<Types of road and their proportion of total length in Japan >

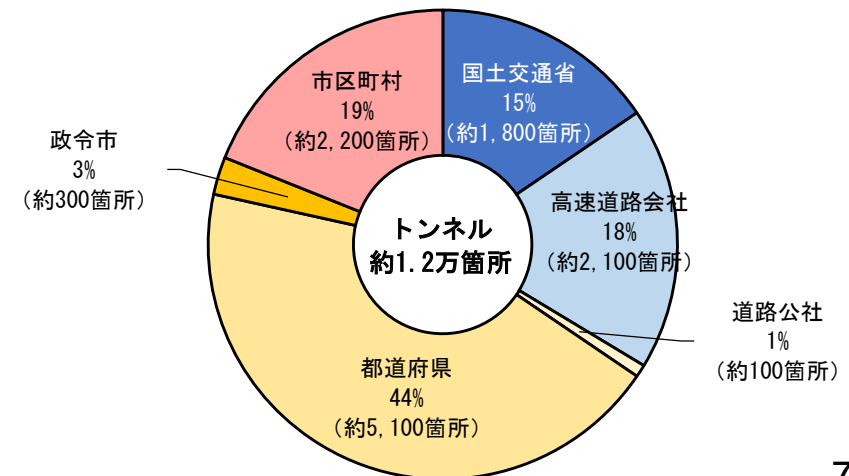


National expressway: as of April 2023, Others: as of April 2021

【By Road Administrator】
< Number of bridges >

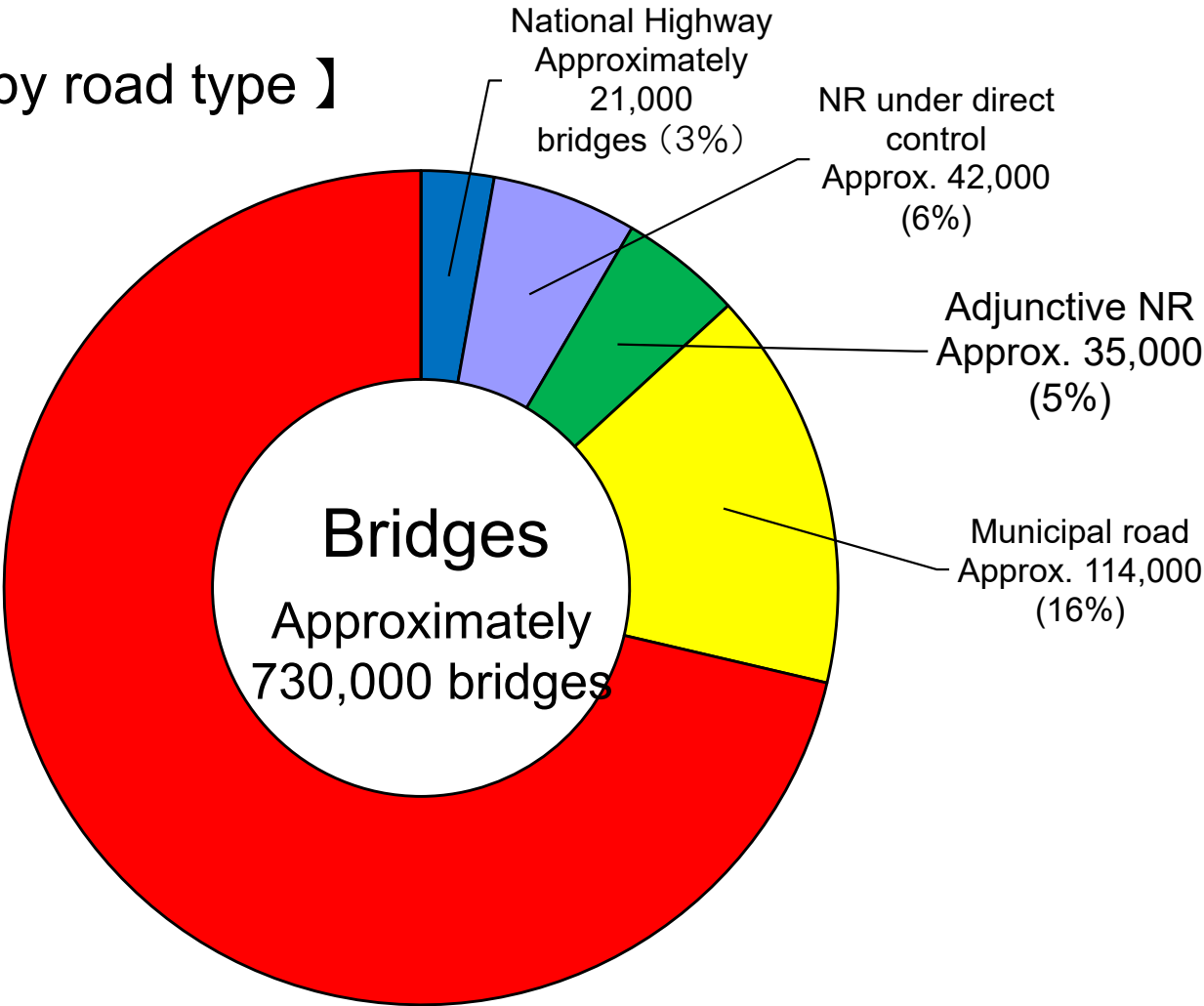


< Number of tunnels >



○ There are about 730,000 bridges in Japan, of which 520,000 bridges are located on municipal roads, accounting for more than 70% of the total.

【 (Number of bridges by road type) 】

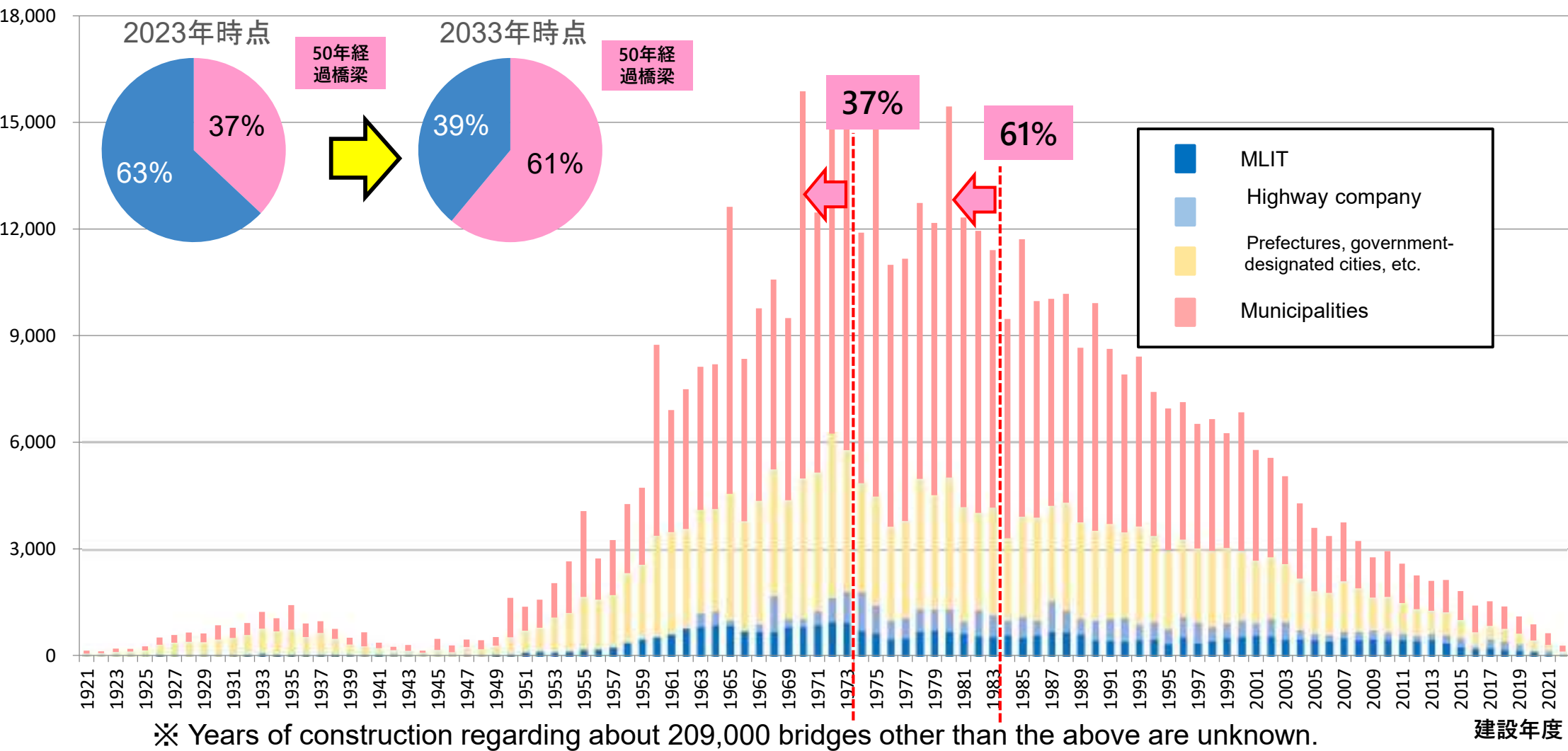


Municipal roads
Approx.
517,000
bridges (71%)

(Source: Highway Department survey (as of March, 2023))

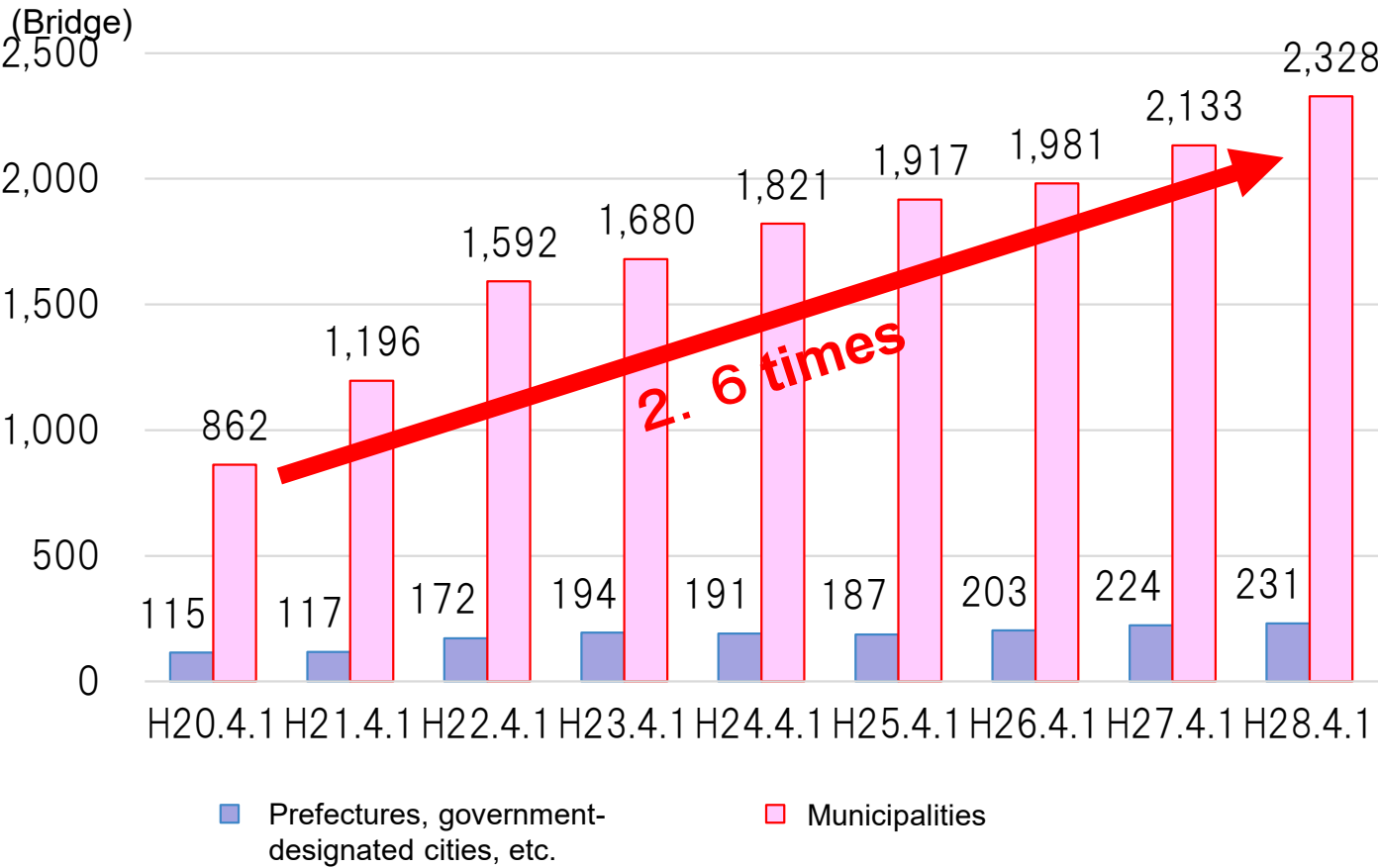
○ 建設後50年を経過した橋梁の割合は、10年後に 約61%に急増

Number of bridges by year of construction



○ In recent years, more traffic regulations have been implemented on the bridges managed by the local public bodies.

[Trends in the traffic regulations of bridges managed by the local public bodies (more than 2m height)]



- ※Road Bureau Research (April 2016)
- Excluding some of the affected areas of East Japan earthquake
 - Figures show the numbers of traffic regulations of each year.



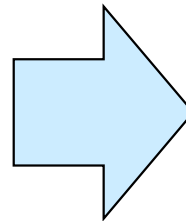
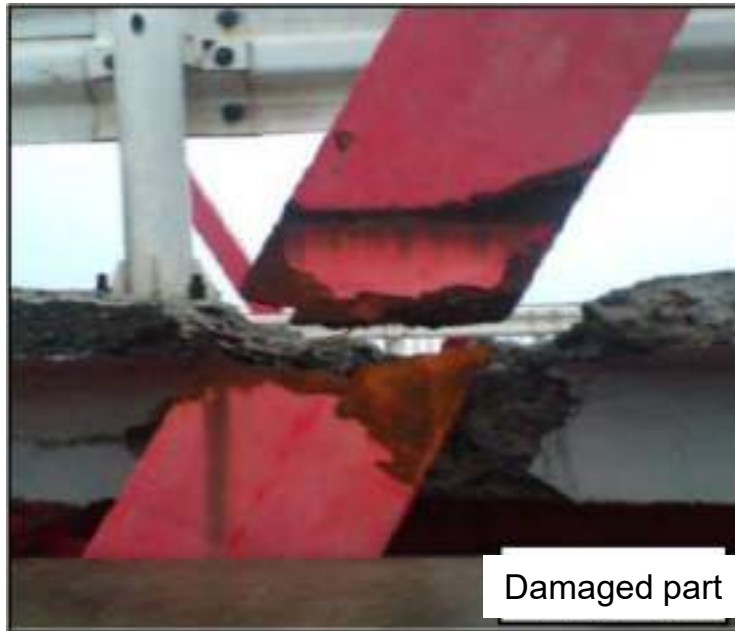
※Example of traffic restriction enforced on bridges due to damage of main cable, corrosion of main girder and concrete slab peeling

Current condition of aging bridge

○ An example of a deteriorated bridge due to aging because of late discovery.

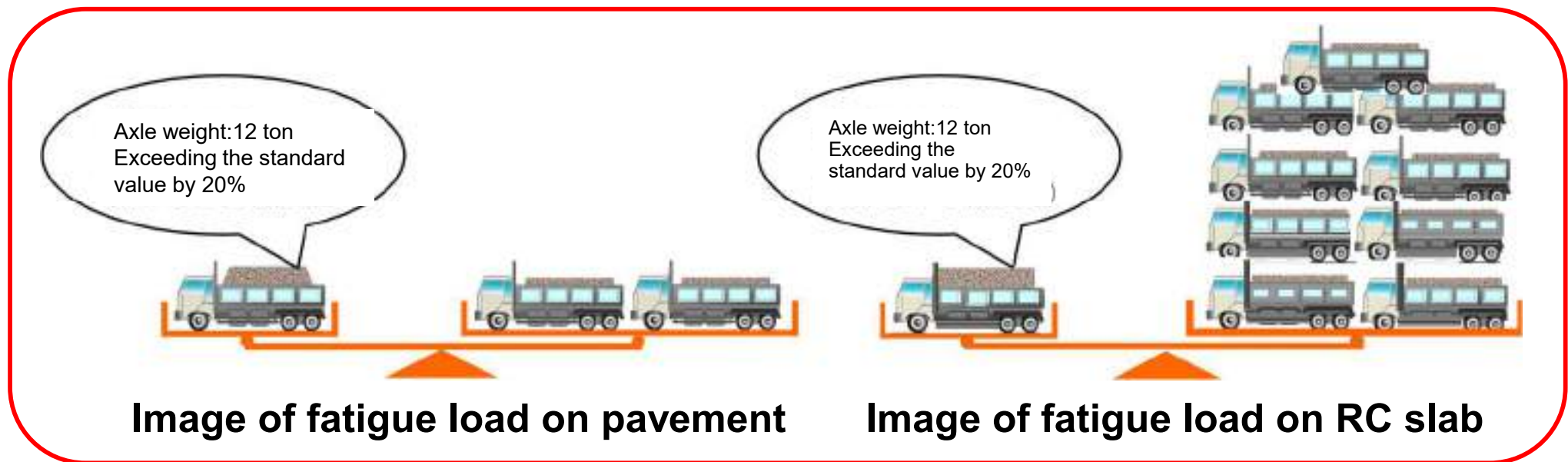
◆ Kisogawa Bridge
(National Route No. 23, Kisosaki-Cho, Kuwana-Gun, Mie Prefecture)

Construction completion year: 1963 (Showa 38)
Damage confirmation year: 2007 (Heisei 19)
(44 years old)



※ Concrete embedding part of truss diagonal members

- Impact on the road due to excessive vehicle weight
 - ・ Fatigue imposed on road structure due to vehicle weight is 4 squares on pavement, 12 squares on RC slabs
- If one heavy vehicle weights more than 2 ton compared to the standard axle load of 10 ton, fatigue load of about 2 vehicles will be imposed on the pavement and that of about 9 vehicles will be imposed on RC slabs.



Even the weight (axle weight) applied to the vehicle axle only exceeds 20%, 9 times damage will occur.

○ Sasako Tunnel ceiling collapse accident [December 2, 2012]



Immediately after the accident



Ceiling board removal status

○ Positioning 2013 as the "first year of social capital maintenance"
○ Amendment to the Road Act [June 2013]
Legalization of inspection standards and establishment of an agency system for repairs, etc. by the government

○ Ministerial ordinance and public notice on periodic inspections published [March 31, 2014]. Inspection by close visual inspection once every five years.



Close visual inspection once every 5 years

区分	
I	健全
II	予防保全段階
III	早期措置段階
IV	緊急措置段階

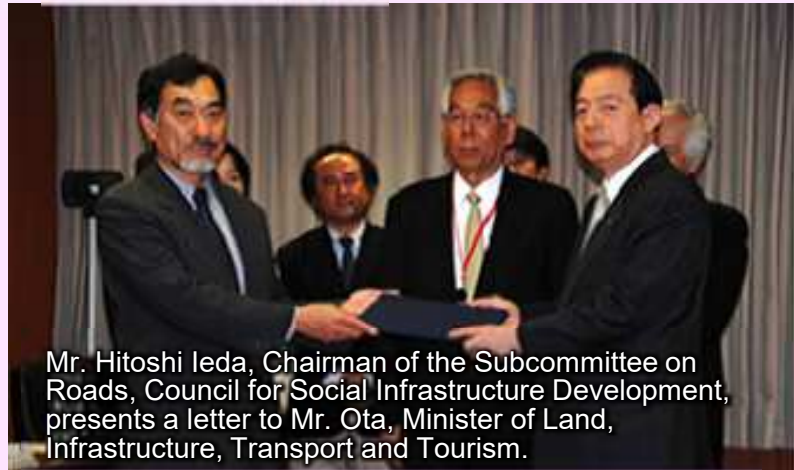
○ Proposal for full-scale implementation of measures against aging roads [April 14, 2014]

● Periodic inspection 1st round (2014-2018)

○ Periodic Inspection Procedure Notification [February 28, 2019]. Streamlining the content of periodic inspections while ensuring their quality

● Periodic inspection 2nd round (2019-)

○ Recommendations for the second phase of infrastructure maintenance [2022.12.2]



Mr. Hitoshi Ieda, Chairman of the Subcommittee on Roads, Council for Social Infrastructure Development, presents a letter to Mr. Ota, Minister of Land, Infrastructure, Transport and Tourism.

April 14, 2014
'Recommendations for Full-Scale Implementation of Road Aging Management'
Last warning - turn to full-scale maintenance now!

- Provincial Orders and Public Notices stipulate that a close visual inspection shall be conducted once every 5 years. The structure shall be categorized in four ranks based on the results of diagnosis of soundness. (same rules to be applied to the structures such as tunnel and bridge)
- In order to carry out smooth inspections in municipalities, we defined a specific inspection method, and included deformed shapes, sample photos, etc in the guideline for periodic inspection.(specific rules to be applied to each structure such as tunnel and bridge)

Laws and regulations, guideline for periodic inspection

The Road Act

Enforced on September 2, 2013

- ・ Regulation stipulating maintenance, inspections and measures

Cabinet order

Provincial Orders/
Public Notices

Promulgated on
March 31, 2014
Enforced on July 1, 2014

- ・ Regulations for inspections of tunnels, bridges, and other constituent facilities of roads or structure or road accessories which have been damaged or corroded, or show deterioration or other abnormality, that might have a severe impact on the road's structure or traffic.
- ・ A close visual inspection shall be performed once every 5 years.
- ・ Results of diagnosis of soundness shall be categorized in four ranks.

(same rules to be applied to the structures such as tunnel and bridge)

Guideline for Periodic
Inspection

Enacted on June 25, 2014

- ・ We implement inspection methods in response to structural features based on Provincial Orders and Public Notices
- ・ We add notes and demonstration pictures.

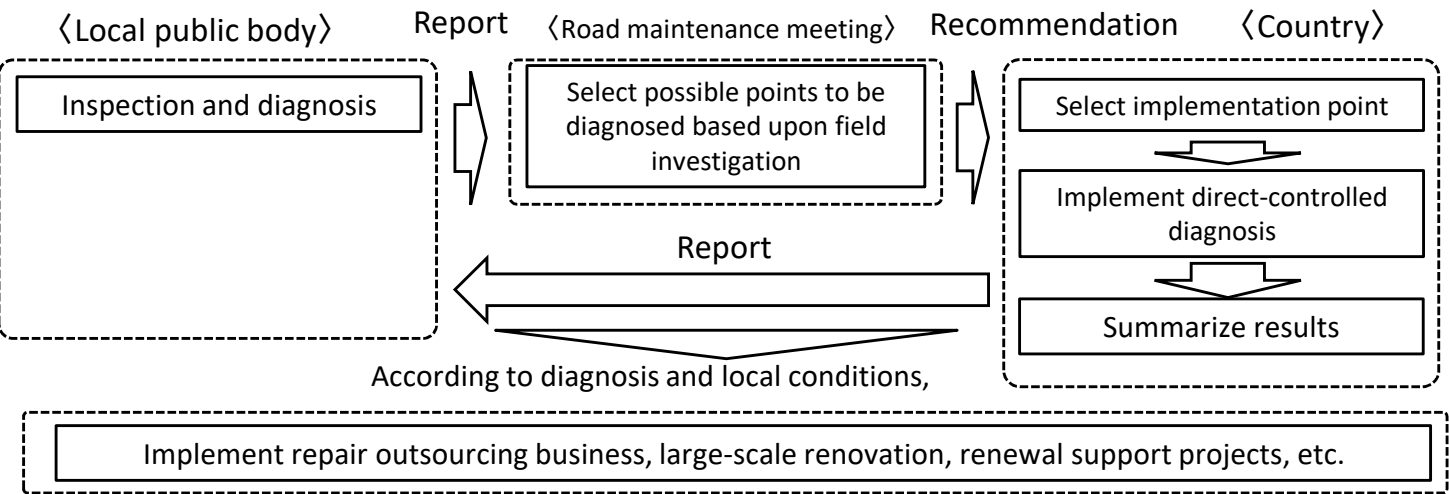
(specific rules to be applied to each structure such as tunnel and bridge)

Direct-controlled diagnosis

- In order to support local public bodies, direct-controlled diagnosis was carried out by their requests on the facilities that require urgent repair and highly advanced technical expertise by Road Maintenance Technology Group that consist of Regional Maintenance Bureau, National Institute for Land and Infrastructure Management (KILIM), personnel of Civil Engineering Institute, etc.
- Based upon the diagnosis and regional conditions, repair outsourcing business, large-scale renovation, renewal projects, etc. have been implemented.

【Diagnosed locations and after treatments】

【Flow of overall process】



Implementa tion Year	Directly Administered Diagnostic Sites	Measures
FY2014	Mishima Grand Bridge (Mishima Town, Fukushima Prefecture)	Repair Agency Business
	Ohdo Dam Bridge (Niyodogawa Town, Kochi Prefecture)	Repair Agency Business
	Omae Bridge (Tsumagoi Village, Gunma Prefecture)	Large-scale repair and renovation subsidy project
FY2015	Numao Shed (Shimogō Town, Minamiaizu District, Fukushima Prefecture)	Repair Agency Business
	Saru-kai Bridge (Totsukawa Village, Yoshino District, Nara Prefecture)	Repair Agency Business
	Yobuko Bridge (Yobuko Town, Karatsu City, Saga Prefecture)	Repair Agency Business
FY2017	Mangokubashi (Yuzawa City, Akita Prefecture)	Repair Agency Business
	Mihoko Bridge (Kanna Town, Gunma Prefecture)	Repair Agency Business
FY2017	Otosawa Bridge (Kurobe City, Toyama Prefecture)	Repair Agency Business
	Otohome Bridge (Nakatsugawa City, Gifu Prefecture)	Repair Agency Business
FY2018	Nigata Tunnel (Kure City, Hiroshima Prefecture)	Repair Agency Business
	Tendai Bridge (Satsumasendai City, Kagoshima Prefecture)	Repair Agency Business
FY2019	Chichibu Bridge (Chichibu City, Saitama Prefecture)	Repair Agency Business
	Furukawa Bridge (Yoshida Town, Shizuoka Prefecture)	Repair Agency Business
FY2020	Shirao Bridge (Shiraoi Town, Hokkaido)	Repair Agency Business
FY2020 To FY2021	Tsurumai Bridge (Nara City, Nara Prefecture)	Repair Agency Business
FY2022	Datezaki Bridge (Koori Town, Date District, Fukushima Prefecture)	Repair Agency Business
FY2025	Hinoshima Bridge (Kami-Amakusa City, Kumamoto Prefecture)	Repair Agency Business

■ Nikata Tunnel (Kure City, Hiroshima Prefecture)



<Status of Nikata Tunnel>



Spalling and penetrating cracks in concrete overlay

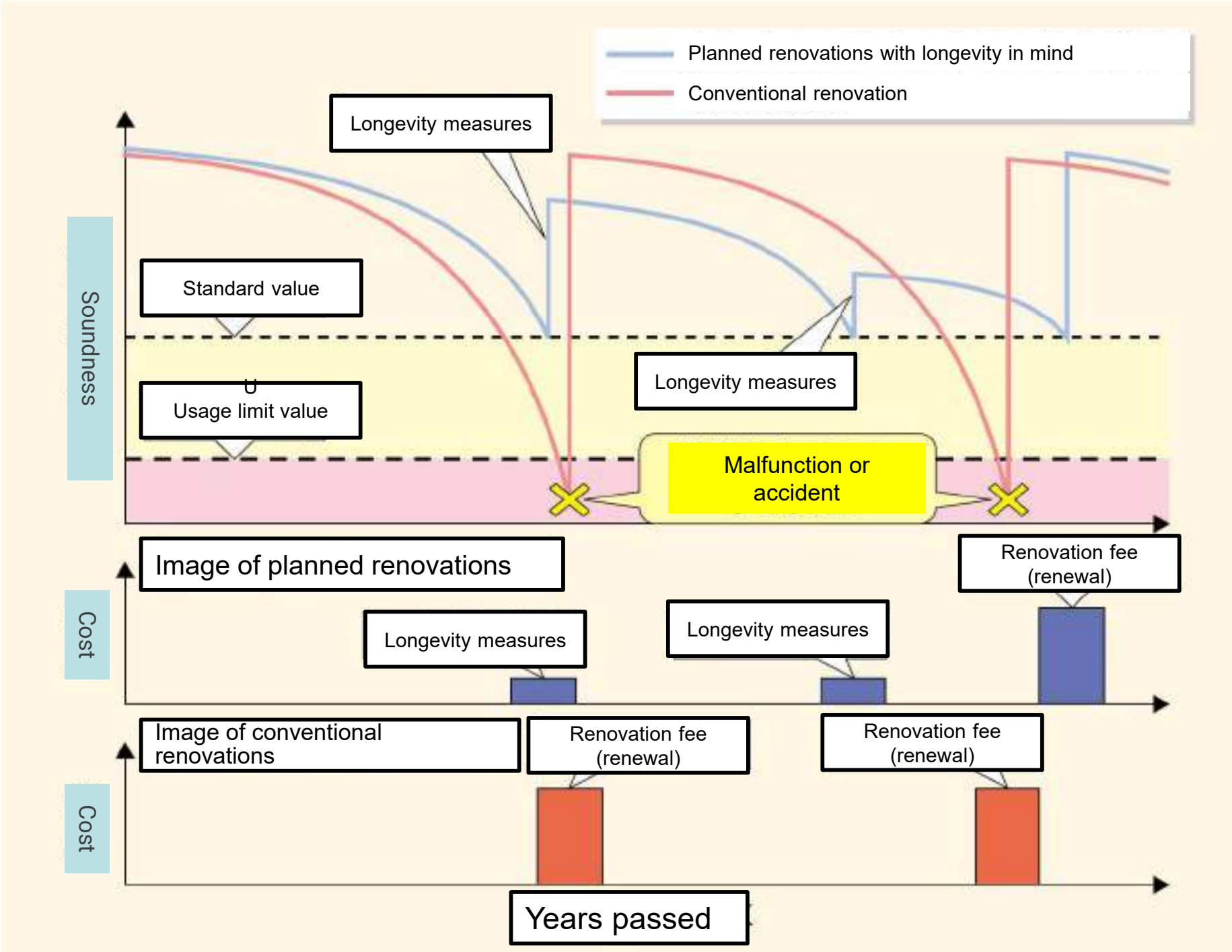
■ Tentaihashi Bridge (Satsumasendai City, Kagoshima Prefecture)



<Status of Tentaihashi Bridge>



Cracks in the substructure



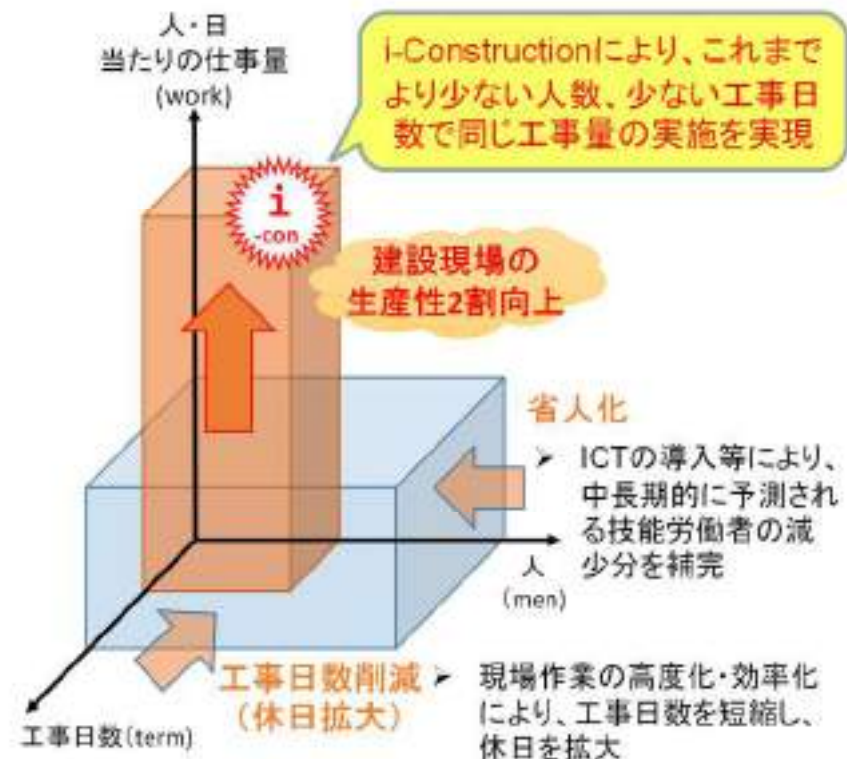
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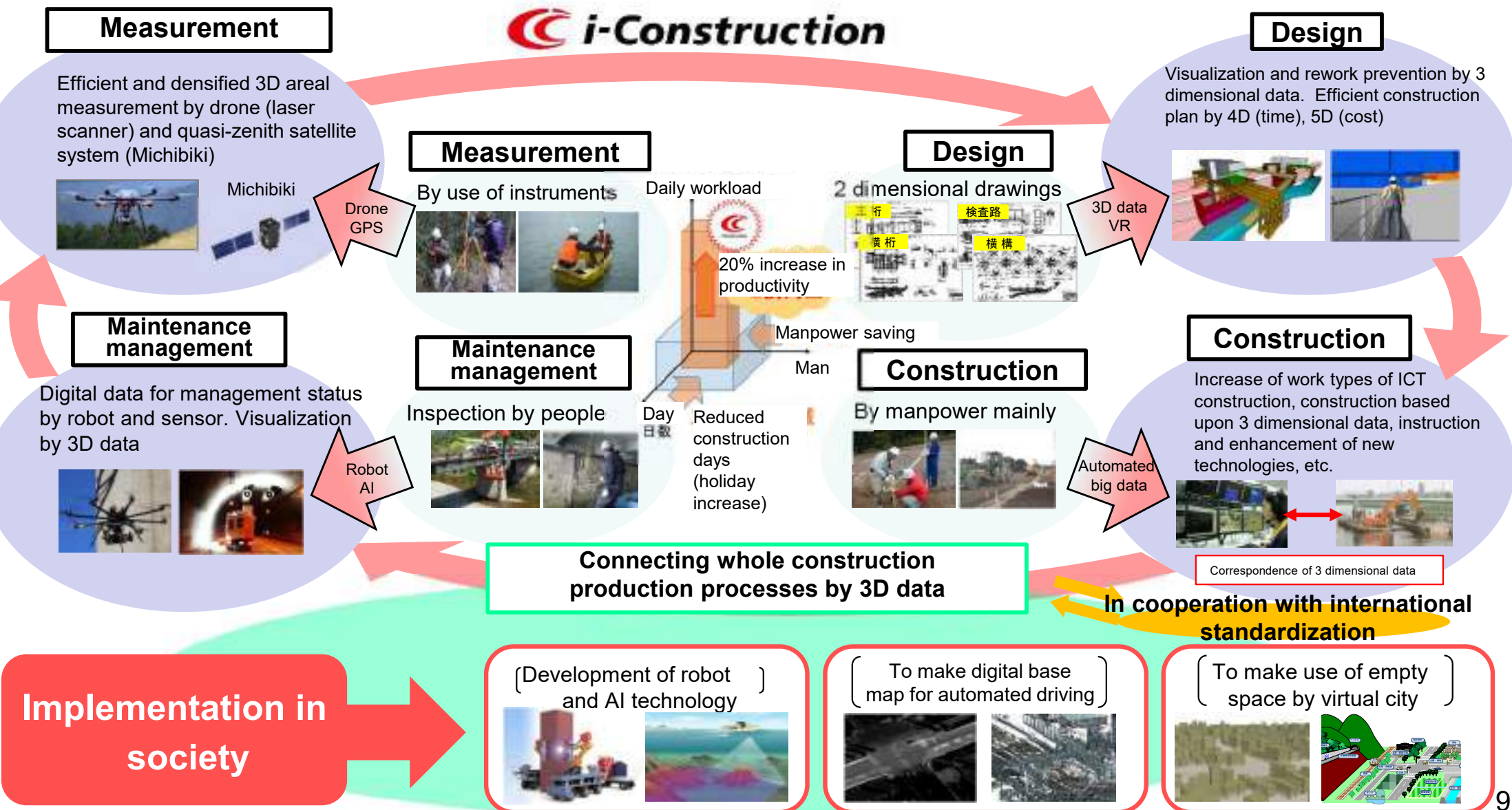
- The construction industry is a key player in improving social capital, and it is also an indispensable "protector of the region" for Japan's national land conservation, which ensuring the safety and security of the society.
- Although population decline and aging are progressing in Japan, in order to fulfill the aforementioned roles, it is necessary to change the way of working such as raise wages in the construction industry and increase holidays for workers, as well as improve productivity.
- The MLIT has been promoting "i-Construction", with the aim of increasing productivity in construction by 20 percent by FY 2025; i.e. utilizing ICT, etc. in all construction production processes from research and survey to design, construction, inspection, maintenance, and renewal.



【生産性向上イメージ】



- **Promote i-Construction** in Society 5.0, aiming to improve construction site **productivity by 20% by 2025**.
- In addition to expanding the types of construction work, improving the efficiency of field work, and leveling the construction period, the entire **construction process, from surveying to design, construction, and maintenance management, will be linked with 3D data** to accelerate the introduction and utilization of new technologies, methods, and materials, as well as to **collaborate with the trend toward international standardization**.



- One-item production at each site and optimal design for each part make it difficult to adopt superior technology in terms of construction time and quality.
- In order to optimize a series of production processes such as design, ordering, material procurement, processing, and assembly, as well as the entire process including maintenance and management, we have introduced an overall optimization concept to improve supply chain efficiency and productivity.
- By standardizing component specifications (size, etc.), we will promote factory production of precast products and prefabricated reinforcing bars, aiming to reduce costs and improve productivity.

Improved efficiency of on-site construction

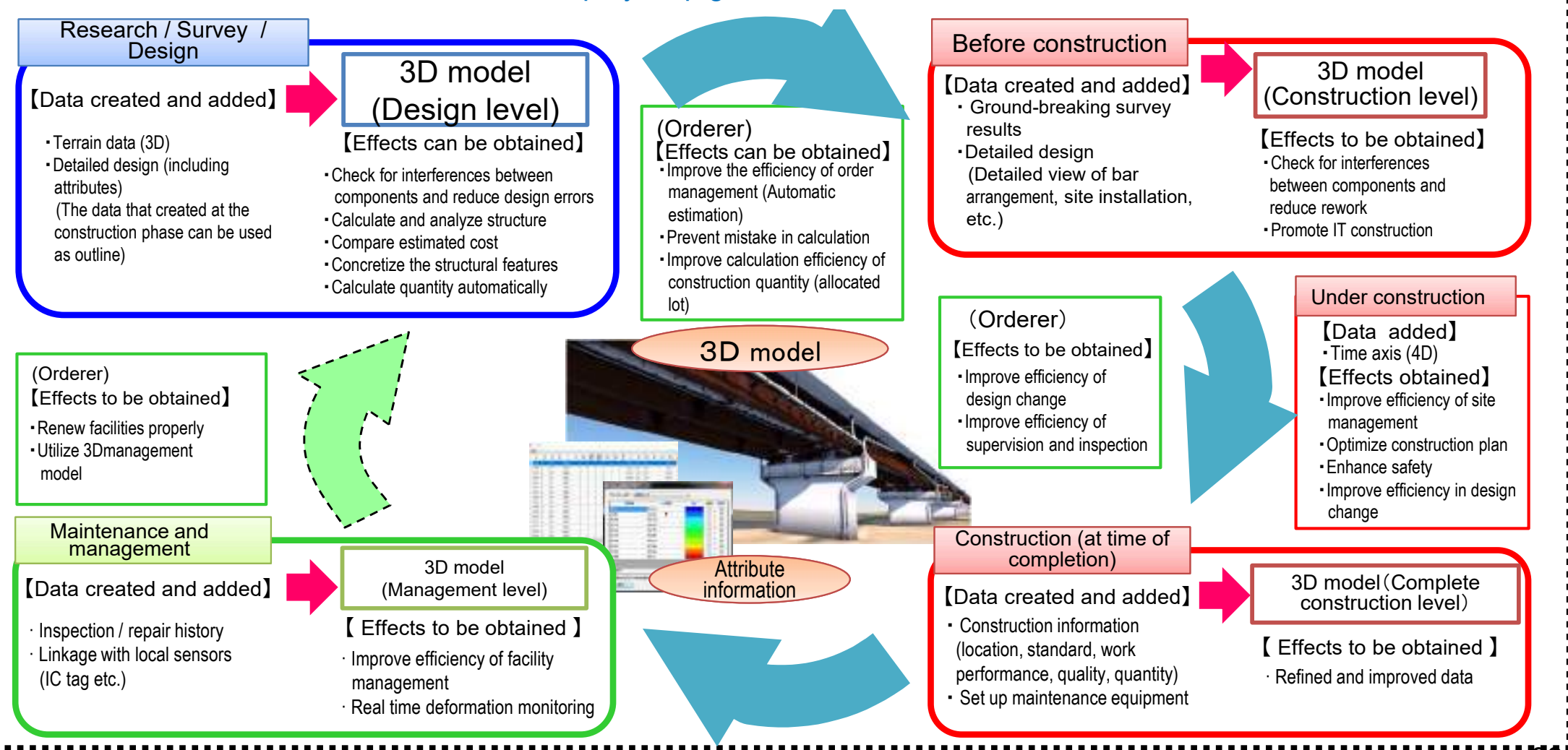
Conventional method

Evolution of precast



○ **BIM/CIM (Building/Construction Information Modeling Management)** refers to a method that **introduces a 3D model** at the planning, survey and design phase of social capital, and later to be applied in the construction, maintenance and management phase; **all the information will be utilized and shared by the parties concerned** throughout the entire project, thus **improves the work efficiency and sophistication of both the orderer and the contractor**.

Step by step guide for creation of 3D model

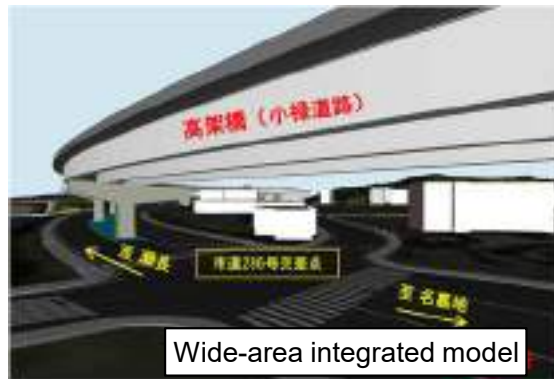


Example of BIM/CIM Initiatives (Oroku Road, Southern National Highway Office)

The “3D Information Utilization Model Project” is being developed to accelerate the introduction of new technologies such as 3D data and ICT, while utilizing BIM/CIM from the survey design to the maintenance and management stages. The “3D Information Utilization Model Project” is currently under development.

<Main CIM utilization contents>

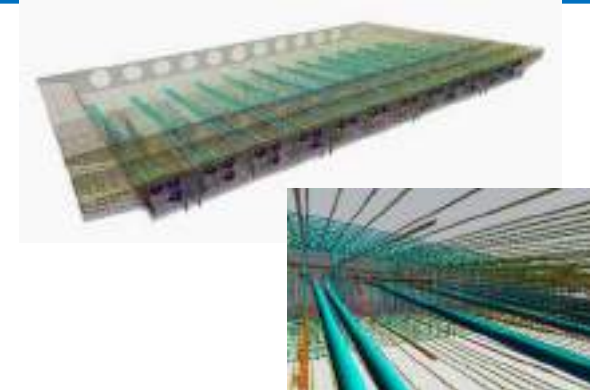
- By visualizing in 3D with a wide-area integrated model and a construction step model, we can speed up consensus building in stakeholder discussions.
- Preventing rework at the construction stage by checking for interference with reinforcing bars in advance at the design stage.
- In order to improve their understanding and skills of BIM/CIM, we also hold seminars (classroom lectures and practical training) for staff.



Wide-area integrated model



Status of police consultation



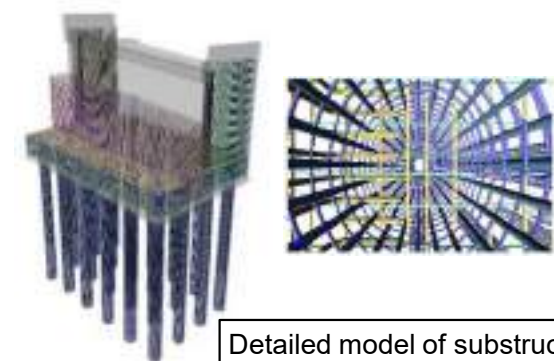
Detailed model of superstructure



Construction step model



Seminars for staff

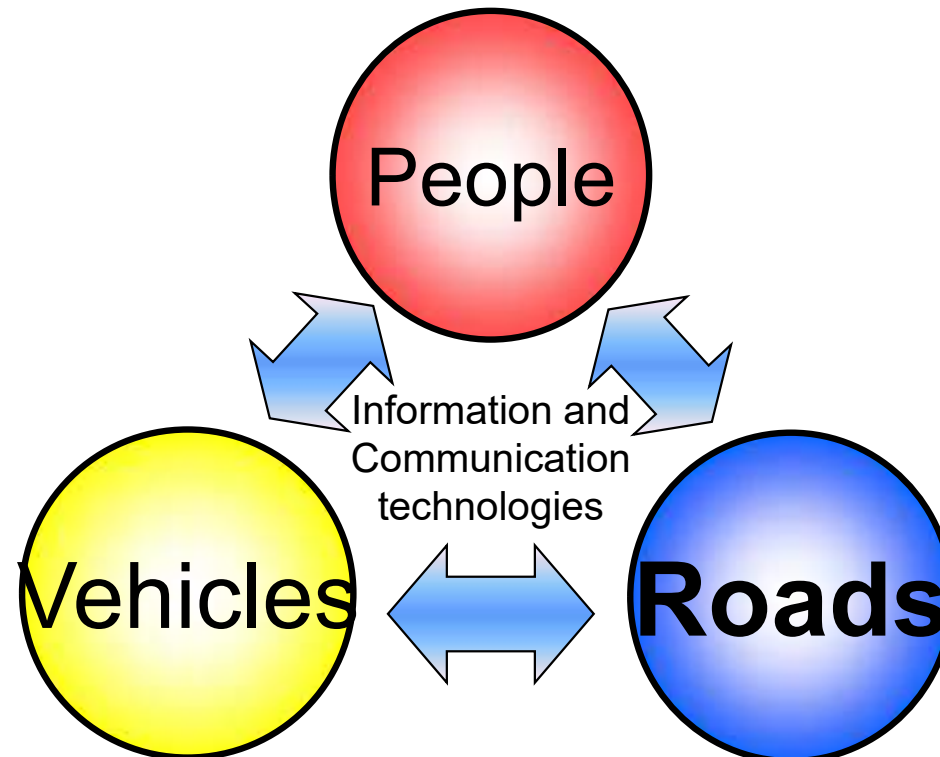


Detailed model of substructure

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- ITS is designed to integrate people, roads and vehicles in order to resolve road traffic problems such as traffic congestion, traffic accidents and environmental degradation.
 - Traffic congestion, Time loss: 5 billion hours annually
 - Traffic accidents : about 300,000 accidents resulting in 2,600 fatalities (FY2022)
 - Environmental degradation : 18% of CO2 emissions from the transport sector (FY2020)



- The four ITS-related ministries and agencies have been promoting ITS in Japan in cooperation with ITS Japan which composed of private companies and scholars as well as the ITS standardization committee.

Cabinet Office (IT Strategic Headquarters)

Cabinet Office (SIP※)
(※Cross-ministerial Strategic Innovation Promotion Program)

ITS Standardization Committee

*Promotion of international
standardization at ISO

Four ITS-related ministries
and agencies (liaison meeting)

MLIT

NPA

MIC

METI

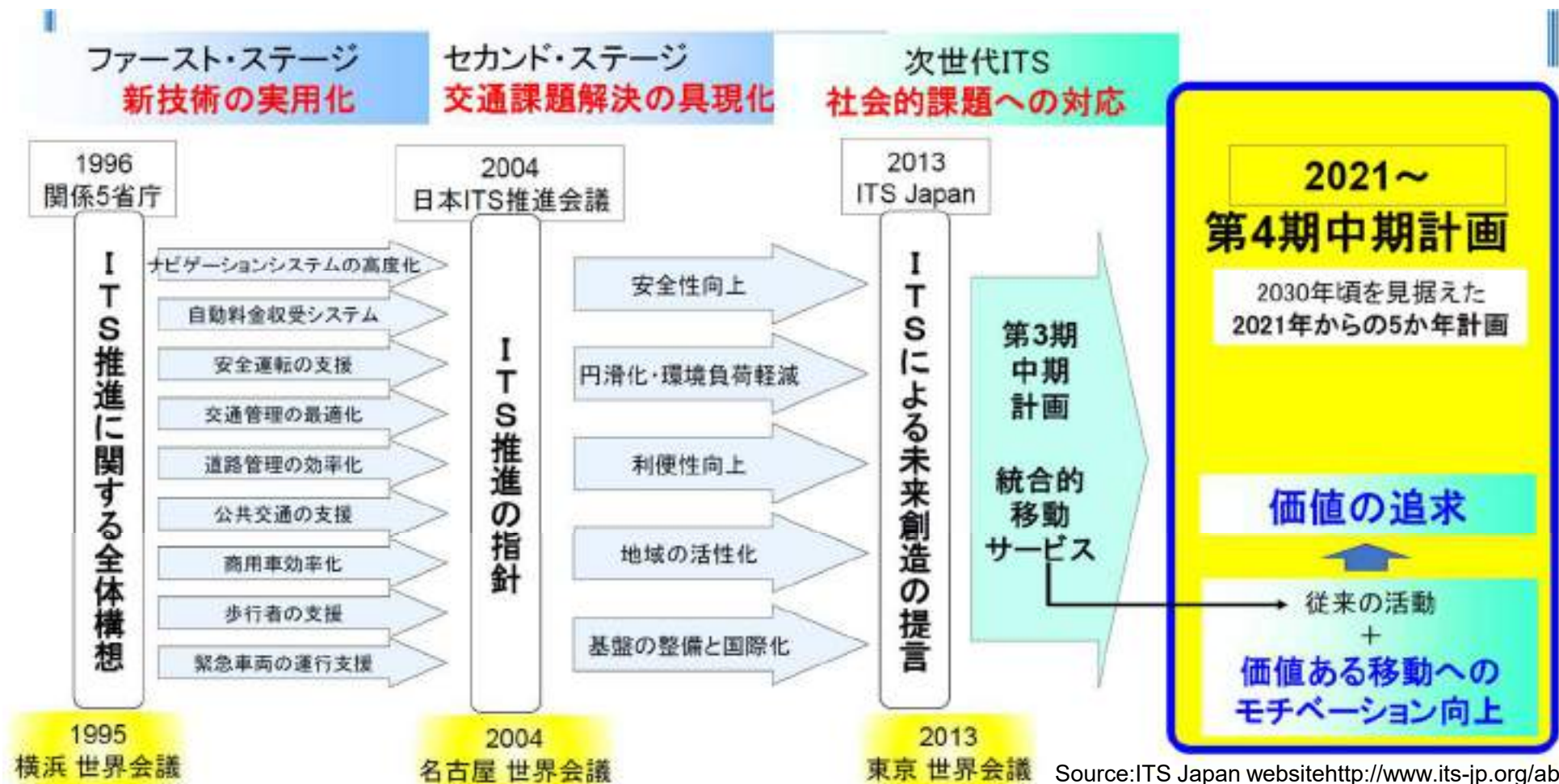
Specified Non-Profit Corporation

ITS Japan

※ Promotion of ITS by the industry and
academia composed of knowledgeable
persons, private parties, etc.

- Activities concerning research,
development and survey
- World conference, committee
activity
- Support activities for
international standardization
- Promotion activities, etc.

- With the formulation of the “Comprehensive Plan for ITS in Japan” in July 1996, relevant ministries and agencies have been unified to put ITS into full-scale promotion in Japan.
- Later, a proposal entitled “The Second Stage of ITS” was issued in 2004, and the efforts aimed at the realization of next-generation ITS were further accelerated. In 2005, a "Public-Private Partnership Research on Next Generation Road Service" was carried out to determine the specifications of the roadside unit and onboard unit, and demonstration experiments have been conducted one after another since 2005.



1990'

1996

2001

2011

2015



Cumulative shipments: about 113.1 million units (2024.3)



Cumulative shipments: about 82.17million units (2024.3)



Cumulative shipments: about 86.58million units (2024.3)

ITS Spot

- Realization of various APPs
- Dynamic route guidance
- Safe Driving support
- ETC ,etc.

Evolution



Enhancement of existing services

- Still image
- Weather information
- Tourist information, etc.

New service

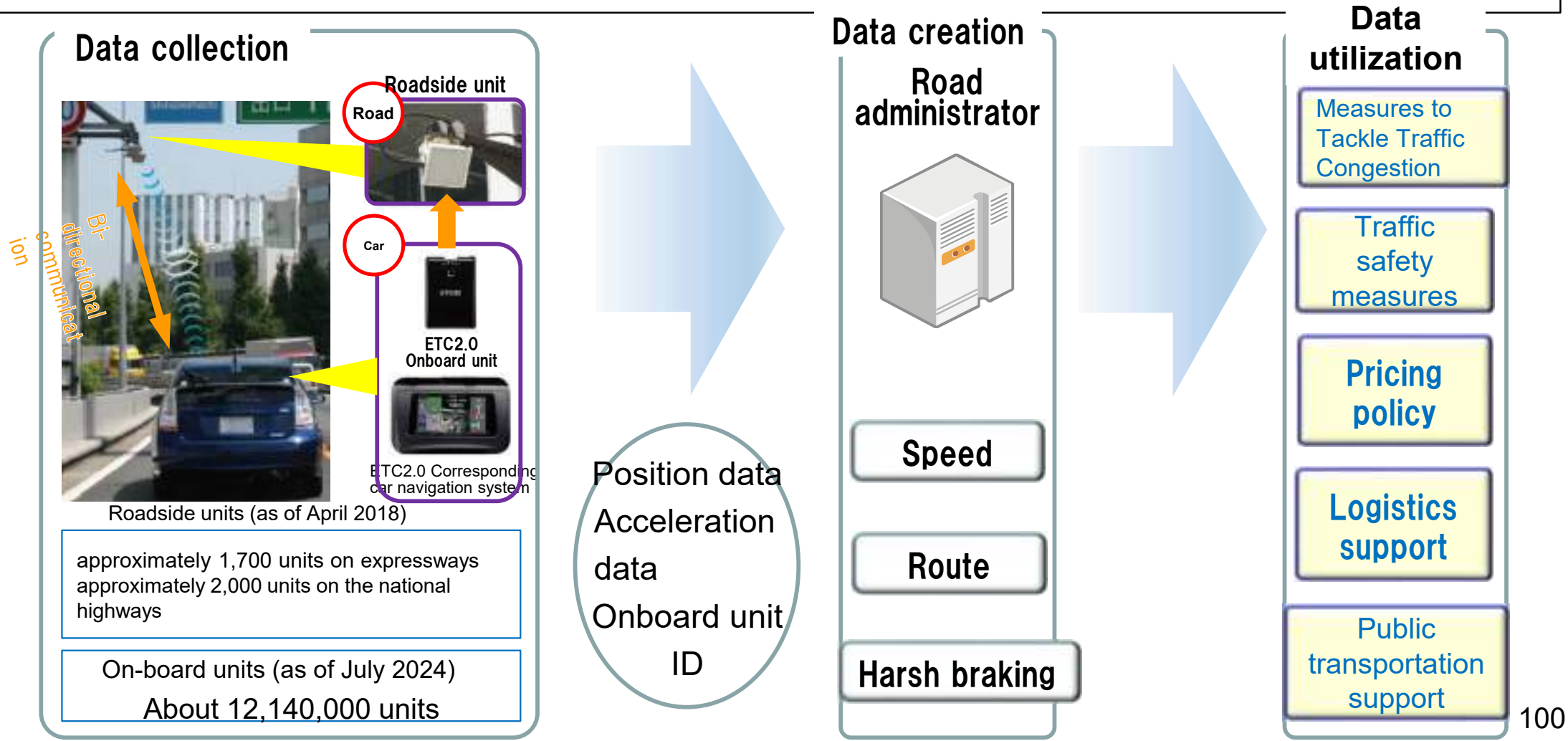
- Smart investment based on big data
- A smart cost that helps to reduce traffic congestion and accident
- ETC - a smart and stress-free toll gate
- Smart logistics management with high productivity

Outline of ETC2.0 System

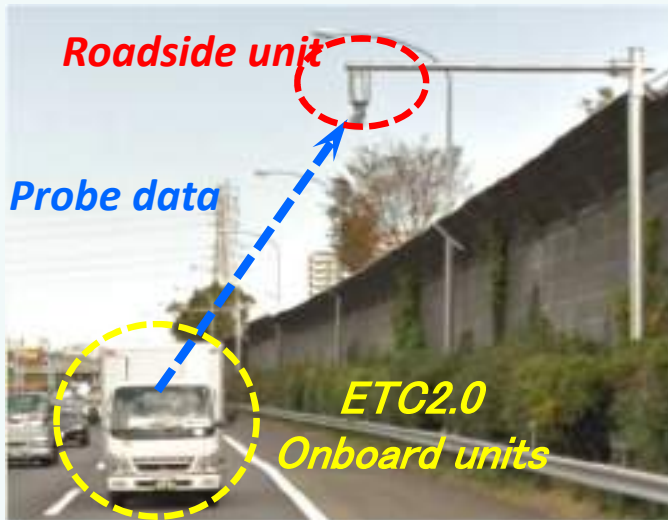
○ Compared to the previous ETCs, ETC2.0 has the following advantages.

- A large amount of information can be transmitted and received.
- It is possible to grasp the route information and IC entry and exit information

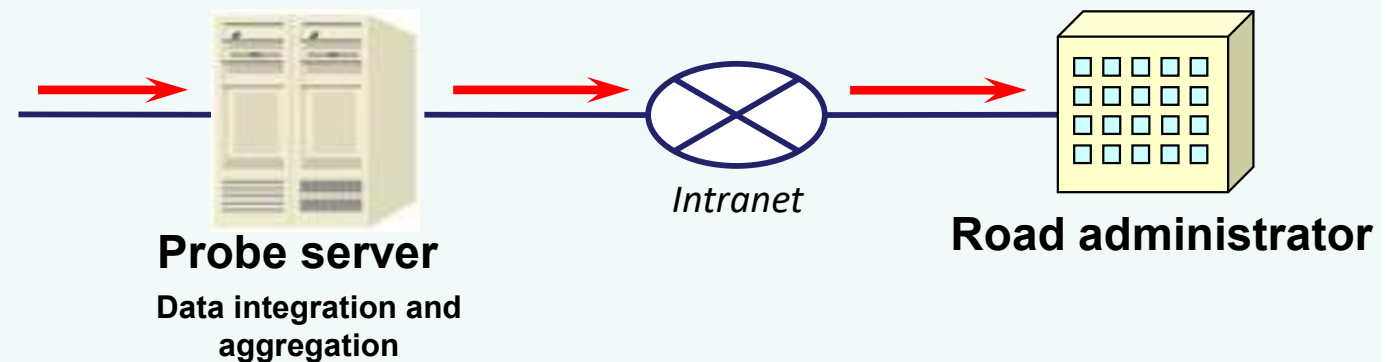
This system has remarkably advanced functions, providing various benefits to road users and road policies, thus greatly boost ITS popularization.



○ Probe data is stored in the ETC2.0-compatible OBUs (corresponding car navigation system), when the vehicles with OBUs pass by the roadside units, the probe data will be gathered.



Steps for probe data collection



Data to be collected:

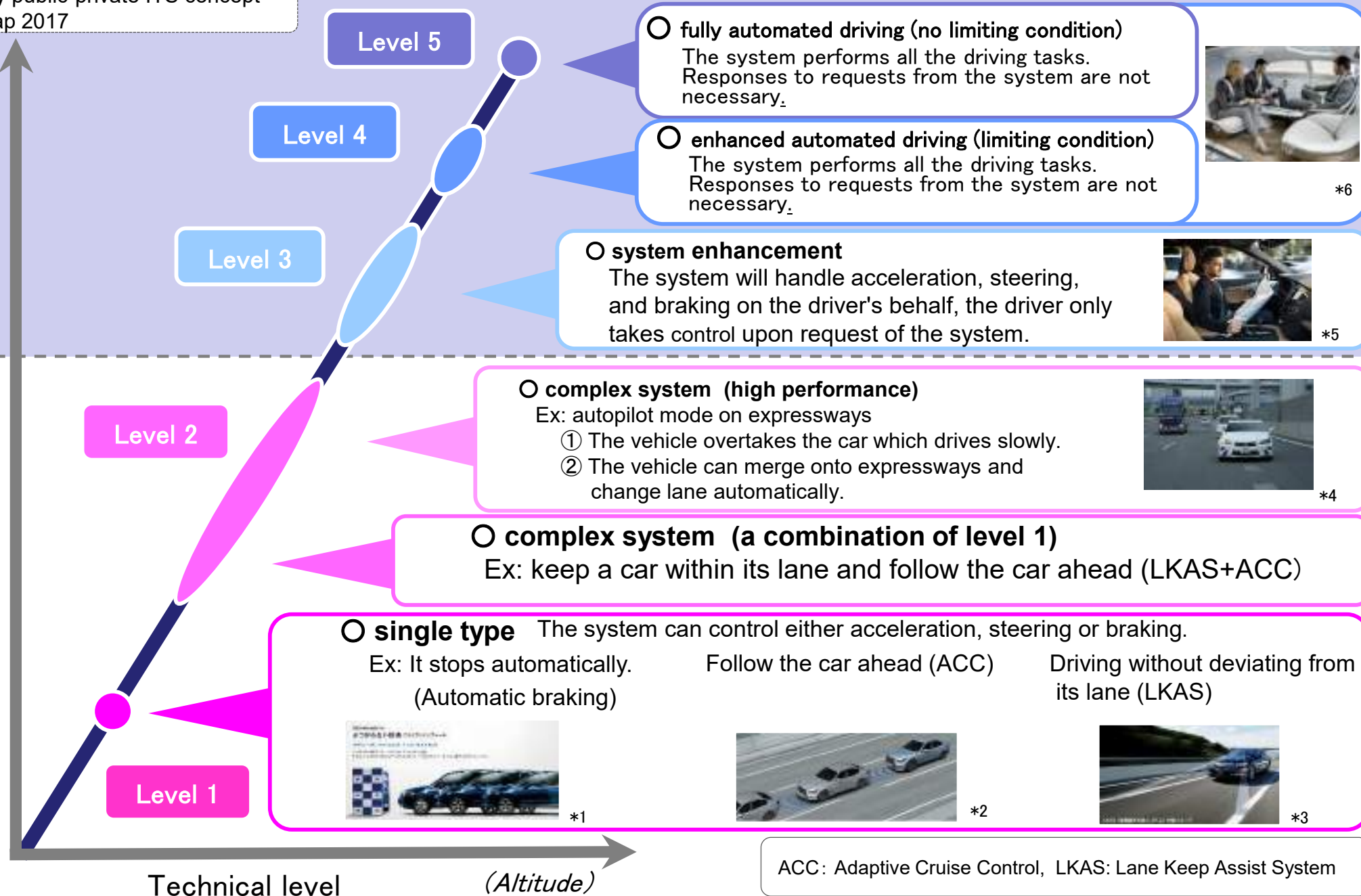
- **Driving history data:** time, position (latitude, longitude), speed, etc.
→ Record will be made every 200m, or when a vehicle changes direction by 45-degree.
- **Behavior history data:** time, acceleration of 4 directions (back, front, right, left), yaw angular acceleration, etc.
→ Record will be made if the acceleration is greater than 0.25 G or yaw angular acceleration is ± 8.5 deg/s.

Various levels of automatic driving

Prepared by public-private ITS concept and roadmap 2017





Monitored by system

Monitored by driver



Current status of autopilot technology

Created based on public-private ITS, road map 2017, etc.

	Present (practical use)	By 2020		Around 2025	TBD
	<div>Level 1</div> <div>Level 2</div> <div>Level 3 (Around 2020)</div> <div>Level 4</div> <div>Level 5</div>				
Prospect for the commercial-ization of autopilot technology  (Honda Giken Kogyo website)	<ul style="list-style-type: none"> Automatic braking Maintain a safe following distance keep within a lane 	<ul style="list-style-type: none"> Automatic steering wheel <u>control on expressways</u> <ul style="list-style-type: none"> - automatic overtaking maneuver - automatic transition from one expressway to another  (Toyota Motor website)	<ul style="list-style-type: none"> Unmanned autopilot mobile service in a reserved area  (DeNA website)	<ul style="list-style-type: none"> Fully automated driving on expressway  (Rinspeed website)	<ul style="list-style-type: none"> Fully automated driving
Development status	Install on commercial vehicles	On-road test of prototype vehicle	Envisioning phase of IT companies	Figure out issues	

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- (7) Improving environment for bicycle use
- (8) Roadside station
- (9) No utility poles

Overview of TEC-FORCE (Dispatch of Technical Emergency Control Force)

What is TEC-FORCE?

※TEC-FORCE (Technical Emergency Control FORCE) : Emergency Disaster Response Team

- TEC-FORCE was established in April 2008 to provide prompt support to local governments and other organizations in preparation for large-scale natural disasters, and this April marks the 15th anniversary of the establishment of TEC-FORCE.
- Against large-scale natural disaster, TEC-FORCE catches swiftly the disaster status obtained by affected municipalities, prevents the expansion of disaster, provides technical support properly and smoothly for quick recovery of affected regions.
- In total 17,887 staffs from each organization of Ministry of Land, Infrastructure, Transport and Tourism were appointed in advance (as of April, 2025).
- TEC-FORCE is positioned in the "Basic Plan for the Promotion of Nankai Trough Earthquake Disaster Prevention Measures (adopted by the Central Disaster Prevention Council in March 2014)," "Basic Plan for the Promotion of Emergency Measures for Earthquakes directly under the Tokyo Metropolitan Area (approved by the Cabinet on March 27, 2015), etc."

Activities

Dispatched liaisons support to municipalities

Understanding the disaster situation

Survey damage by helicopter



[September 2015, heavy rain in Kanto and Tohoku] (Joso City, Ibaraki Prefecture)



[May 2015, volcanic activity on Erabujima] (Yakushima Town, Kagoshima Prefecture)



[[August 2014, Hiroshima landslide disaster] (Hiroshima City, Hiroshima Prefecture)

Ensure the monitoring system using satellite communications



[September 2014, eruption of Mt. Ontake] in] (Otakimura, Nagano Pref.)

Technical advice to autonomous bodies



[April 2016, Kumamoto Earthquake] (Kumamoto Prefectural Government)

Emergency discharge through drainage pump vehicle



[September 2015, heavy rain in Kanto and Tohoku] (Kurihara City, Miyagi Prefecture)

Technical advice to the lifesaving rescue activities

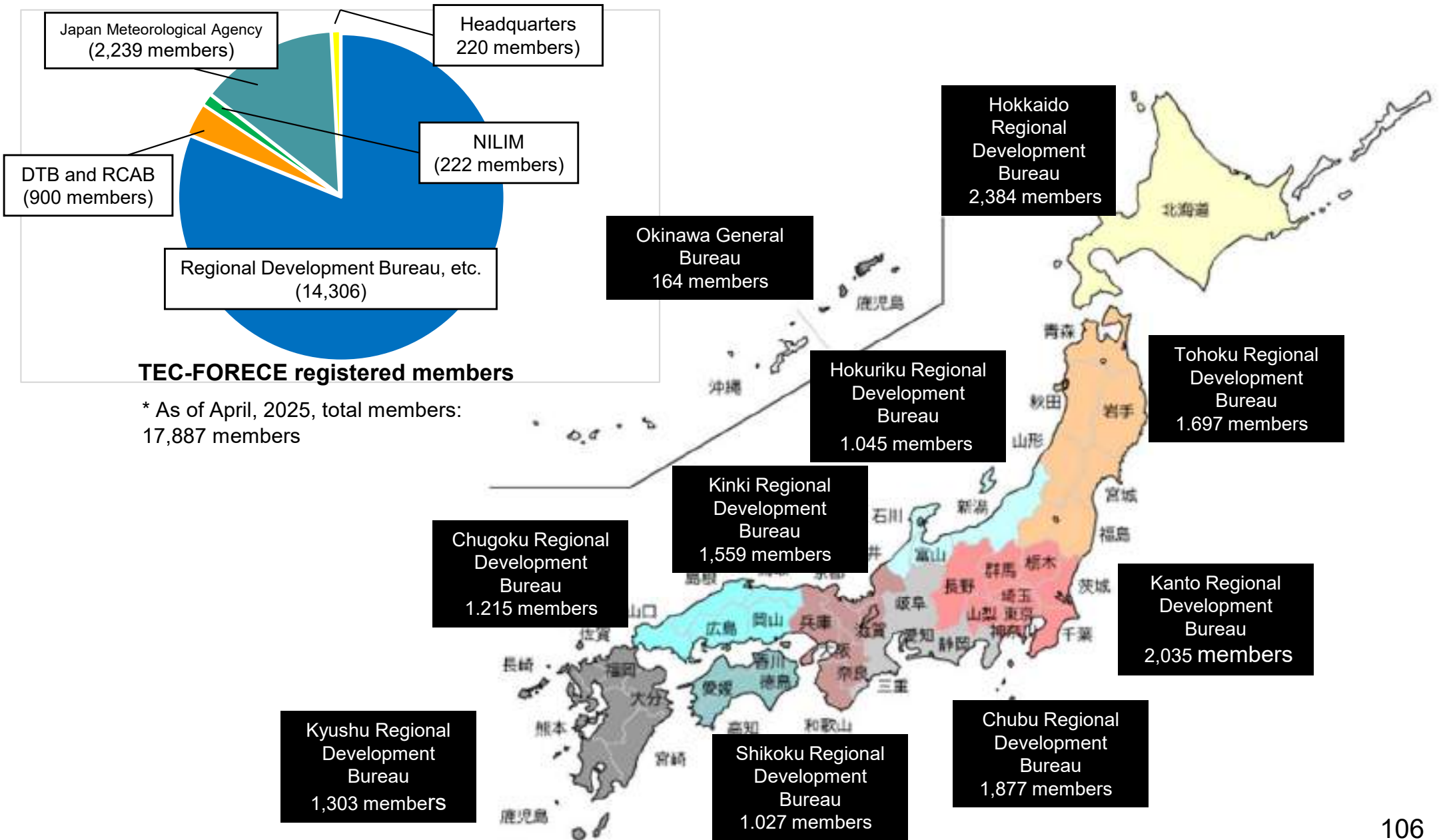


[April 2016, Kumamoto Earthquake] (Minamiaso Village, Kumamoto Prefecture)

Number of team members of TEC-force (Dispatch of Technical Emergency Control Force Team)

TEC-force members are mainly appointed to the regional development bureaus across the country, and are gathered together depending on the size of the disaster.

※ Rest of the members consist of the staffs from MLIT headquarter, DTB, NILIM, JMA, GSI, etc., they conduct researches by utilizing their expertise, provide technical instructions to support autonomous bodies.



- In order to prevent the occurrence of secondary disasters caused by aftershocks and rainfall, 9-day inspection was conducted mainly in municipalities where seismic intensities observed were higher than level 6, specifically, 1,155 areas vulnerable to sediment-related disasters, and the inspection reports have been made to the Kumamoto Governor and 13 chiefs of the municipalities.
 - Inspection result of the areas that were vulnerable to sediment-related disasters
Degree of hazard A:54 locations, hazard B:77 locations, hazard C:1,024 locations
- Due to fear of post-earthquake landslide, Aso-shi and Minami-so requested us to conduct an inspection. In response to the requests, we conducted damage inspections in Yomine mountain, Tarutamagawa, Gailin mountain in order to identify collapsed area and crack. We have reported inspection findings and provided technical advices concerning continuous monitoring of landslide areas, etc.

Identified damage areas from the air



■ Research using UAV

Inspected areas that were vulnerable to sediment-related disasters



■ Site survey

Inspection reports and advices



■ Kumamoto prefecture governor



■ Minami Aso village chief

- Promptly cleared impassable prefectural and municipal roads due to landslides and collapsed roads.
- Secured access roads to the affected autonomous bodies and an alternative route for national road No. 57 that has become impassable due to large-scale sediment-related disasters.
 - ・Opened national road No. 443 (April 20) and secured the access road to the impassable town center of mashiki-machi.
 - ・Opened Milk Road (April 22), Green Road Minami aso (April 22), National Road No. 442 (April 25), and secured an alternative route for the national road no. 57 leading to Aso direction that became impassable due to large-scale slope collapse.

Grasped disaster situations



◆ national road No. 443 (mashiki-machi)



◆ Green Road Minami aso

Emergency road recovery (road opening)



◆ national road No. 443 (mashiki-machi)



◆ Green Road Minami aso

Secured a passage of emergency vehicles



Secured a passage of emergency vehicles (mashiki-machi)



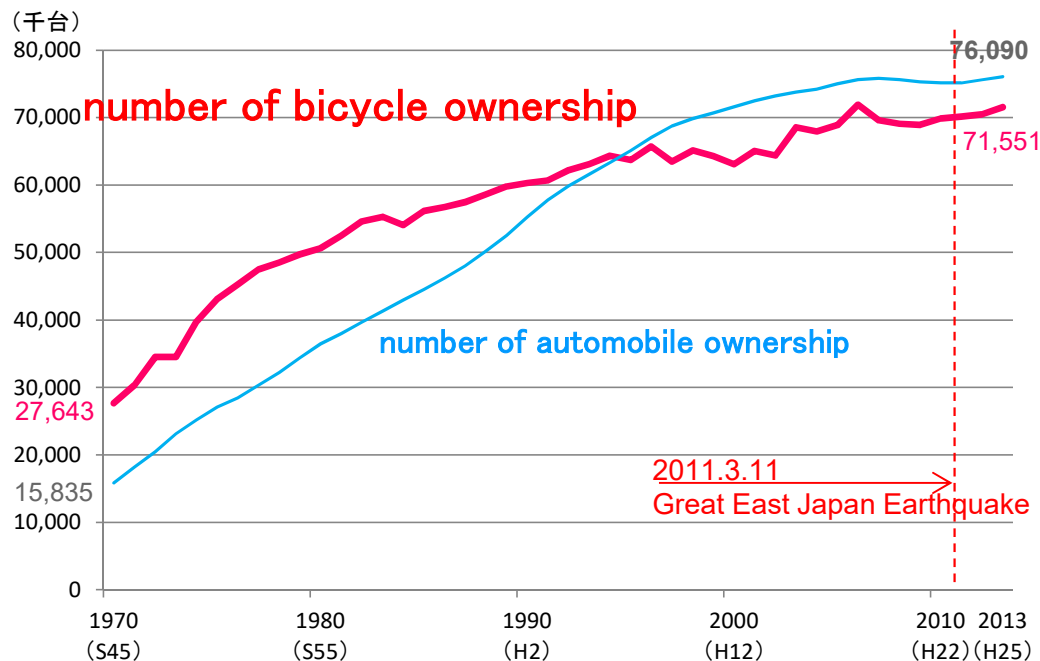
◆ Secured the road from east to west between Kumamoto area and Aso area

4. Policies Concerning Road in Japan

- (1) Congestion countermeasures
- (2) Traffic safety measures
- (3) Road maintenance
- (4) i-Construction
- (5) Road ITS
- (6) TEC-FORCE
- (7) Improving environment for bicycle use
- (8) Roadside station
- (9) No utility poles

○ The number of bicycles owned in Japan is increasing at the same level as automobiles (about 72 million units).

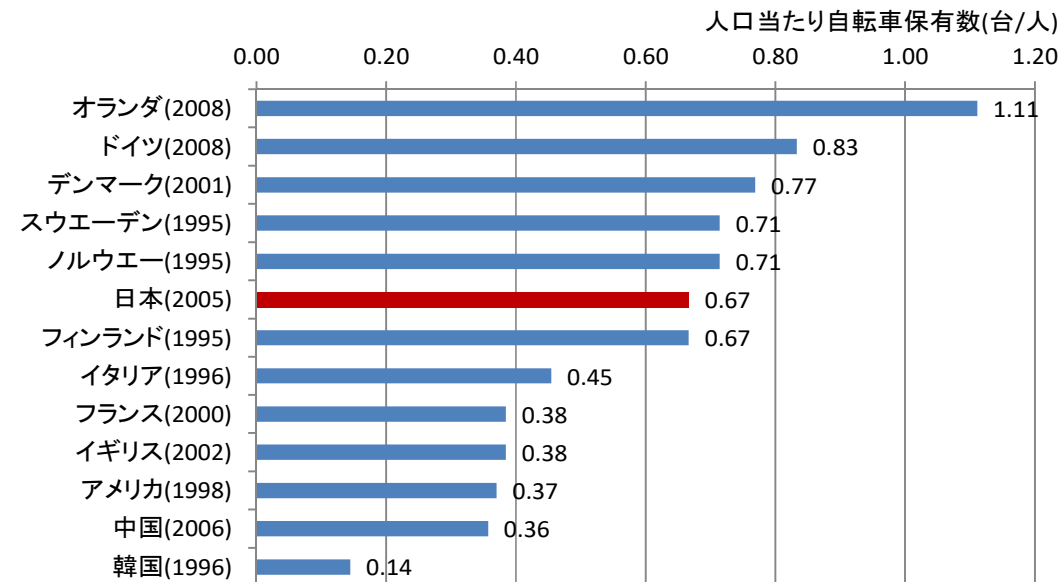
◆ Trends in the number of bicycle ownership



* Bicycle ownership is estimated by a sample survey. The registered number of the automobile ownership of each March, except for two-wheeled vehicles.

[Source: bicycle (1970-2008) Bicycle Association, Bicycle (2009-2013) Japan Bicycle Promotion Institute, automobile- AIRIA]

◆ Bicycles ownership per capita (international comparison)



* () stands for the statistical year.

[Source: Japan Bicycle Promotion Institute Statistics 43]

History of Cycling Policies in Japan

The Road Traffic Act of 1960 stated that cyclists, as light vehicle drivers, must use the left part of the roadway.

Automobile traffic has entered a period of rapid growth since 1955, and in 1974 the number of passenger cars increased by about 20 times then that of 1955.

As a consequence, the number of traffic accidents and that of traffic fatalities were greatly increased.

This figure rose with the growing use of motor vehicles, peaking at 16,765 in 1970 and leading to what was then described as a "traffic war."

In 1970, in order to reduce the traffic volume, the Public Safety Commission introduced a traffic regulation that allowed cyclists to ride on sidewalks if they do not disturb pedestrians passing.

Since then, a dedicated lane for cyclist and pedestrian were installed, thus bicycle paths were separated from the roadways.

In July 2007, The Traffic Safety Policy Task Force reviewed the conditions for bicycle use on the walkway, and introduced a policy concerning promotion of safe bicycle usage".

In October 2011, the NPA issued a comprehensive measure with the aim of ensuring the safety of cyclist and pedestrian, based on the fundamental concept that bicycles are a type of vehicle.

In November 2012, MLIT and the NPA jointly developed "A guideline for creating a safe and pleasant cycling environment" to help road administrators and prefectural police to engage in planning and developing road networks for cyclists and to raise awareness of traffic laws.

In June 2015, following amendments to the Road Traffic Act, it is stipulated that cyclist may pose a danger to the public as motorists do.

In July 2016, in response to the recommendations from the "Committee for Creating a Safe & Comfortable Bicycle-Use Environment" dated March 2016, "Guideline for Creating a Safe & Comfortable Bicycle-Use Environment" was revised, in order to realize the "Procedure of Developing Bicycle Network Plan" and "Recommendations for Development of Safe and Comfortable Bicycle Facilities Network".

In May, 2017, the Act on Promotion of the Use of Bicycles was promulgated.

- Based on the idea that bicycles are “a type of vehicle,” cyclists shall ride bicycles on the roadways, it was suggested that the roadways shall be constructed for cyclists as well.
- In addition to bicycle roads, bicycle lanes, etc., a roadway shared by both bicycles and automobiles was proposed.

■ Types of construction

Roadways

Separate pedestrian and vehicle traffic routes

Bicycle road

Bicycle-only road space structurally separated from the roadway using,



Bicycle lane

Bicycle lanes are provided exclusively for cyclists, based on traffic regulations. Visual segregation of bicycles and automobiles



Road markings serve to visually separate the bicycle track from the pedestrian track on roads with no sidewalks.



Mixed vehicle lane (for bicycles and automobiles)

Mixed use on vehicle lanes by bicycles and automobiles

Belt-shaped markings, or pictograms are used to indicate where cyclists are supposed to be traveling, they also serve to bring the attention of motorists.



[Current issues]

- The bicycle-use environments that have been created by municipalities in various areas are **limited to the places where bicycle paths are easy to be maintained, hence it is only partially done.**
- Due to this partially done construction, safe and comfortable bicycle paths are mixed with non-safe paths, thus the effects are limited.

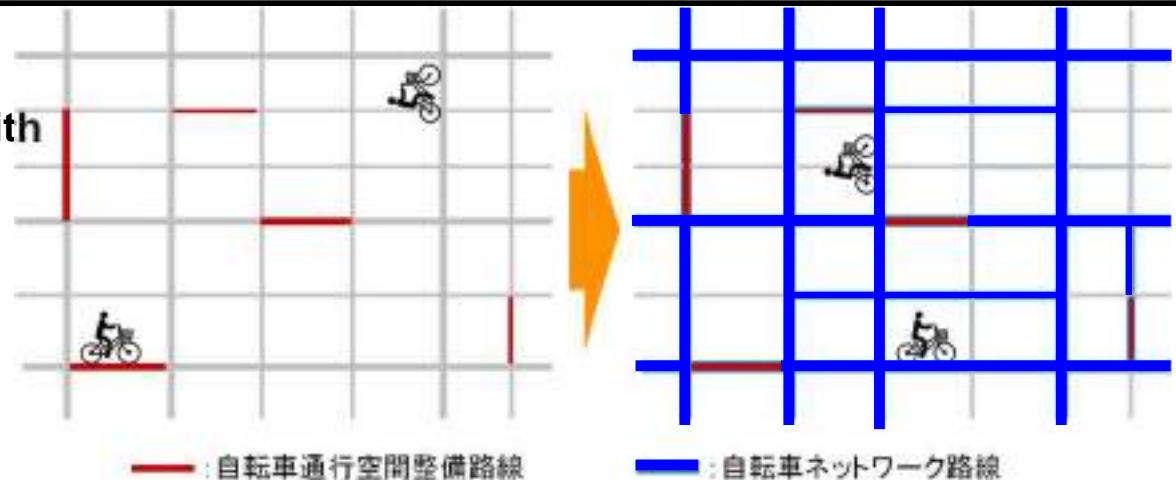
Bicycle Network Plan

A plan that determines a network route and shows types of road to be installed, with the aim of installing effectively and efficiently safe and comfortable bicycle paths.

* Examples of network routes

Routes that connect public transportation facilities, schools, commercial facilities, main residential areas, etc., or shared route for pedestrians and cyclists, or routes where accidents occur frequently, etc.

- Entities in charge of the formulation of the network
 - Municipalities formulate the network jointly with road administrators, prefectural police, etc.
- Contents indicated in the network plan
 - Principles and goals
 - Planning areas
 - Bicycle network routes and type of roads to be installed
 - Installation priority



【Image of continuous bicycle network】

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- (7) Improving environment for bicycle use
- (8) Roadside station**
- (9) No utility poles

Purpose of “Roadside Stations”

- To provide road users with safe and conformable road travel conditions
- To contribute to local economies

Functions of “Roadside Stations”

Rest space

- 24-hour, free-of-charge parking and toilets

Information source

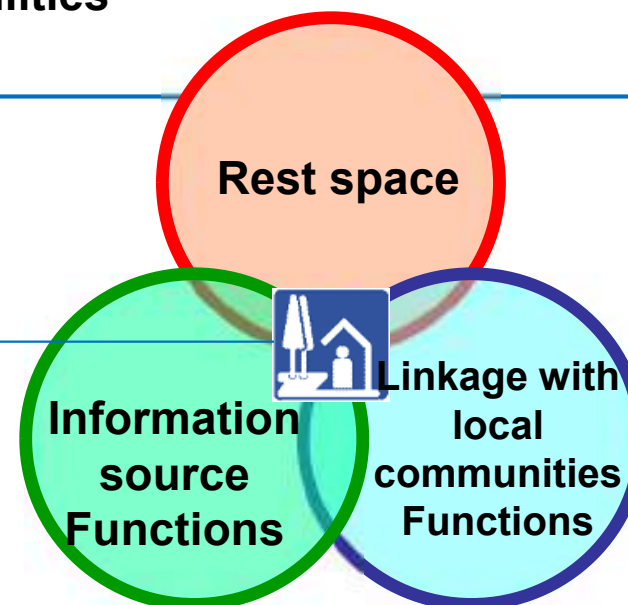
- Road traffic information, local tourist information

Linkage with local communities

- Cultural, tourism and recreational facilities and other local rejuvenation facilities

Basic concept of a “Roadside Station”

Special and bustling places created with local communities



Serve as a disaster prevention area in case of disaster

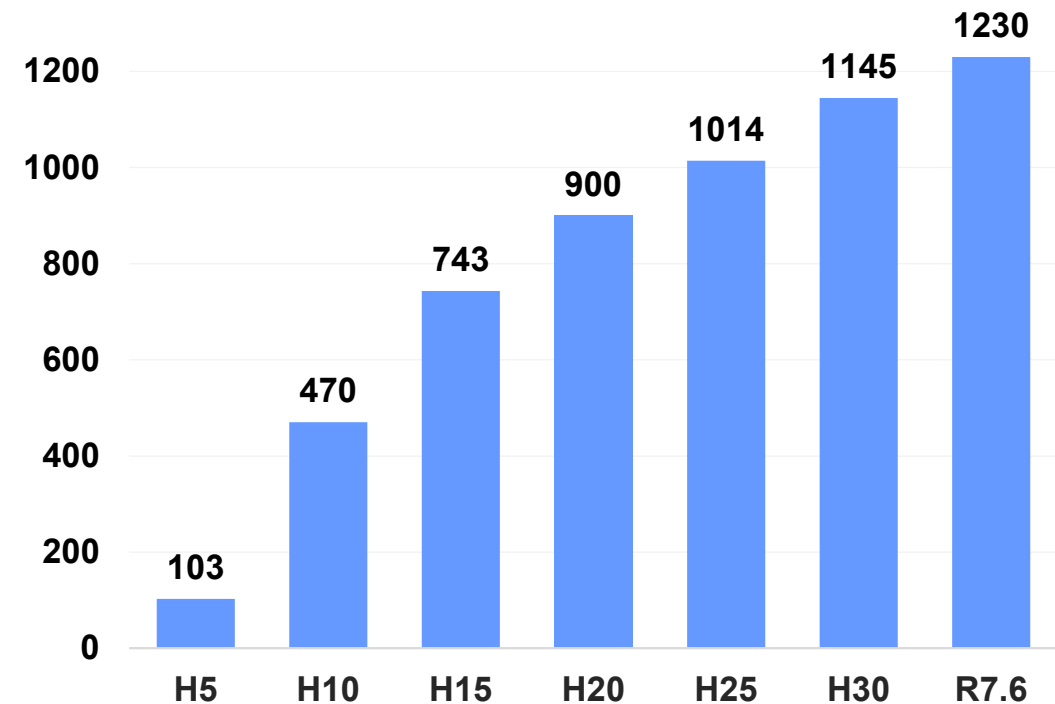
- "Roadside stations" are rest facilities along the roads, mainly created by municipalities, and are registered with the MLIT.
- Since the establishment of the system in 1993, the number of roadside stations has increased to 1,230 nationwide.

■ Image of roadside station facilities



In addition to parking and toilets, roadside stations are also used as a place of information source and communication and are equipped with rest facilities and local rejuvenation facilities.

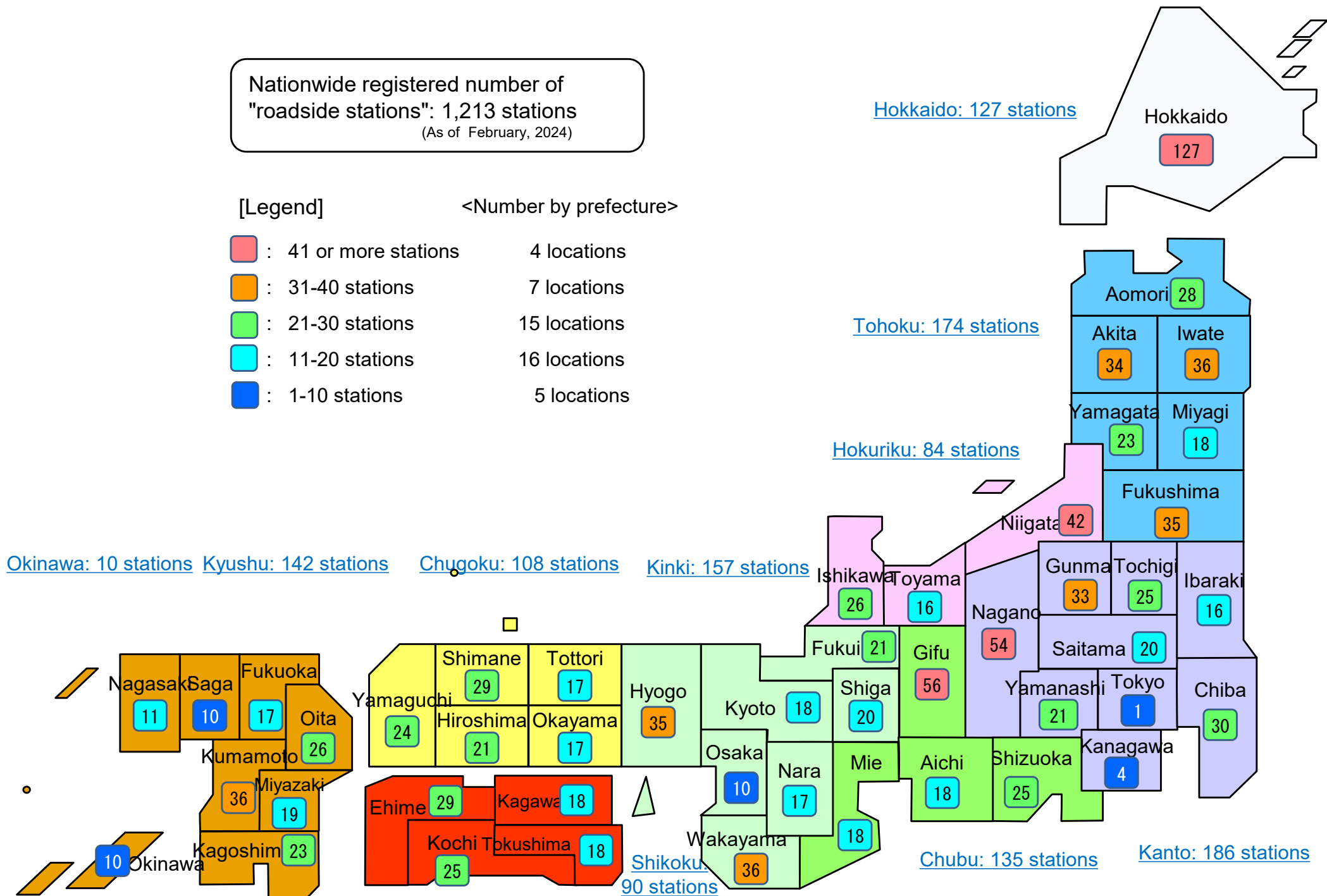
■ Trends in the registered number of roadside stations



Registered number of "roadside stations" by prefecture

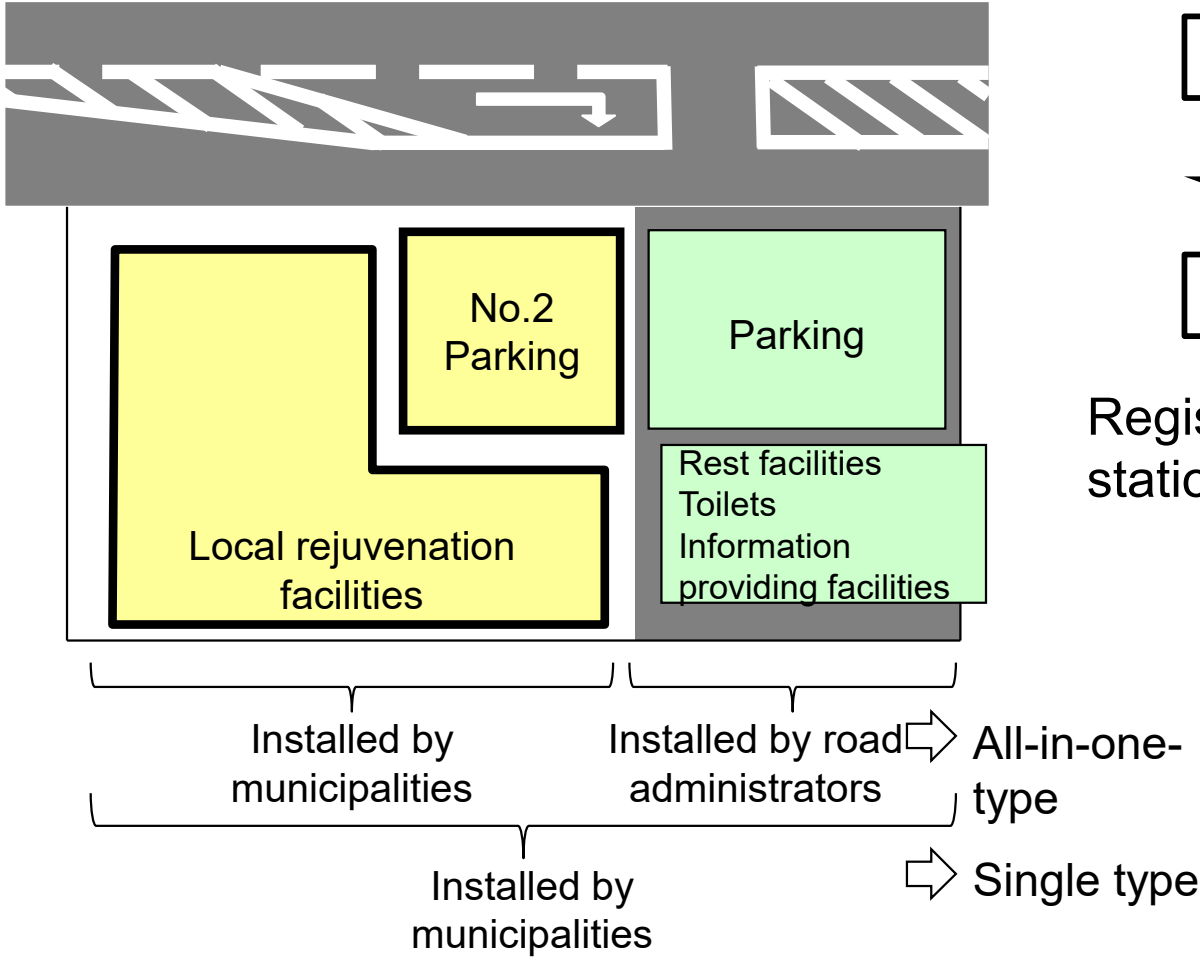
Nationwide registered number of
"roadside stations": 1,213 stations
(As of February, 2024)

[Legend]		<Number by prefecture>
	: 41 or more stations	4 locations
	: 31-40 stations	7 locations
	: 21-30 stations	15 locations
	: 11-20 stations	16 locations
	: 1-10 stations	5 locations

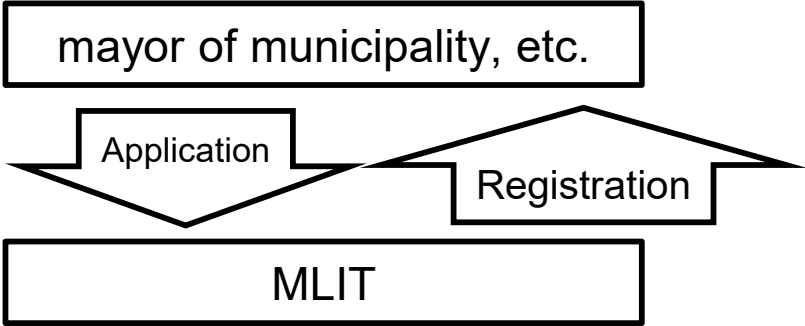


- Roadside stations can be installed by municipalities or other alternative public organizations
- Mayor submits the application to the MLIT.
- There are 2 types of roadside stations, one is all-in-one type installed by road administrator and mayors, etc; another is single-type installed by municipalities.

Entities in charge of installation and the contents



Registration process for roadside stations



Registered number of roadside stations

* As of June 13, 2025

Total number of roadside stations:

1,230 stations

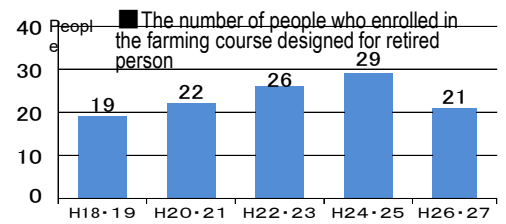
All-in-one-type: 673 stations (55%)

Single-type: 557 stations (45%)

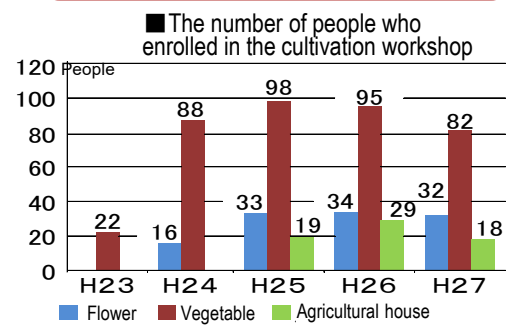
Roadside Station is used to promote "local production for local consumption," in order to boost the consumption of local products (Example).

- A tomato house (1,000 m²) has been developed as an experience-based support facility, and new graduates of a college for training farmers in the prefecture are hired as cultivation managers.
- Local special product (tomato) became a brand, local industries are promoted, and jobs are created thanks to 6th industrialization.

"Hitachi-OTA" (Hitachi-Ota-shi, Ibaraki Prefecture)

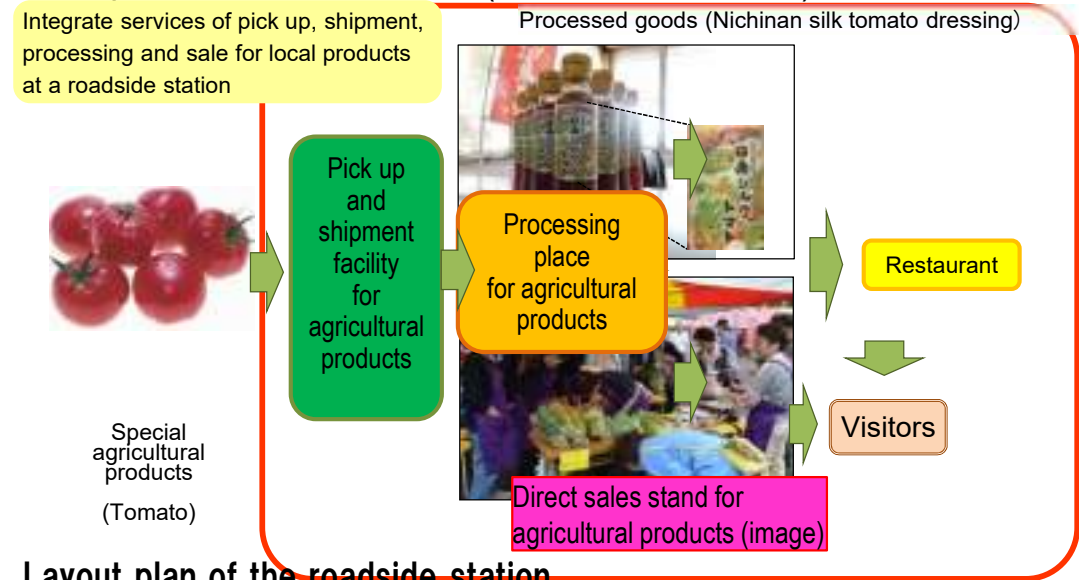


Since 2006, as farmer, 47 people among all enrollees, have participated in the shipment to the early-morning market, etc .

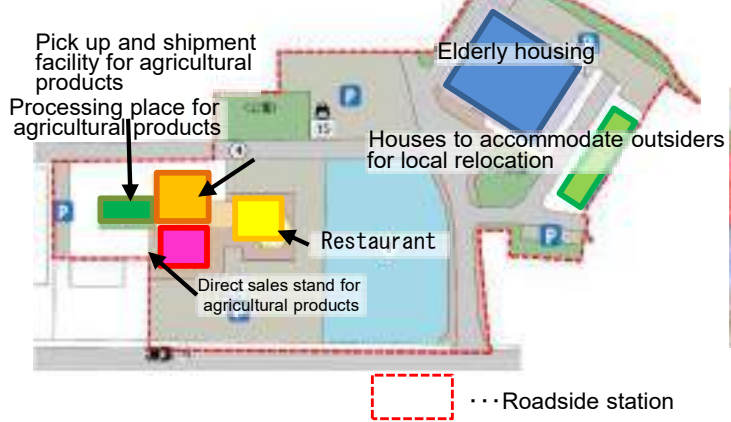


Nichinan Hinokawanogo, (Tottori Prefecture)

A place to exchange interaction between local people and visitors, and to promote local industries (6th industrialization)



Layout plan of the roadside station Nichinan Hinokawanogo facility



Processing place for agricultural products (image)

- "Roadside station" is equipped with power-generating facility that can run 24 hours a day even during a blackout, and a storage warehouse, a heliport, etc., it is used as a local disaster prevention center.
- Even at the time of the Great East Japan Earthquake, it served as a base of rescue operation and relief activities, collection and distribution of materials, shelter of the residents, food supply center and so on.

<Example of "roadside station" that enhanced the disaster prevention function>



"MINO Niwaka Teahouse" (Mino-shi, Gifu Prefecture)

- Equipped with an emergency power supply that can last for 3 days in times of a disaster (Cafeteria, information providing facilities, and toilets are available)
- In times of a disaster, cafeteria is used as a cooking facility. (A 40t potable water storage tank is installed.)

Cycle station

Agricultural products shop, cafeteria
Information providing facilities

○ "Roadside station" serves as a disaster-prevention facility



Emergency power generator



Storehouse



Potable water storage tank



Heliport

<Example of "roadside station" that served its functions at the time of the Great East Japan Earthquake>

○ Logistic support base of self-defense army



"Tono Kazenooka" (Tono-shi, Iwate Prefecture)

○ Shelter for residents

- It is open 24 hours, providing rice balls, sweets, etc, thanks to the power supply from a private electric generator.



"Sanbongi" (Osaki-Shi, Miyagi Prefecture)

○ Supply food and daily necessities to the residents of the affected areas

- After the earthquake, the business was resumed within one week, thanks to the shipment from local farmers. The only food and grocery store in the town



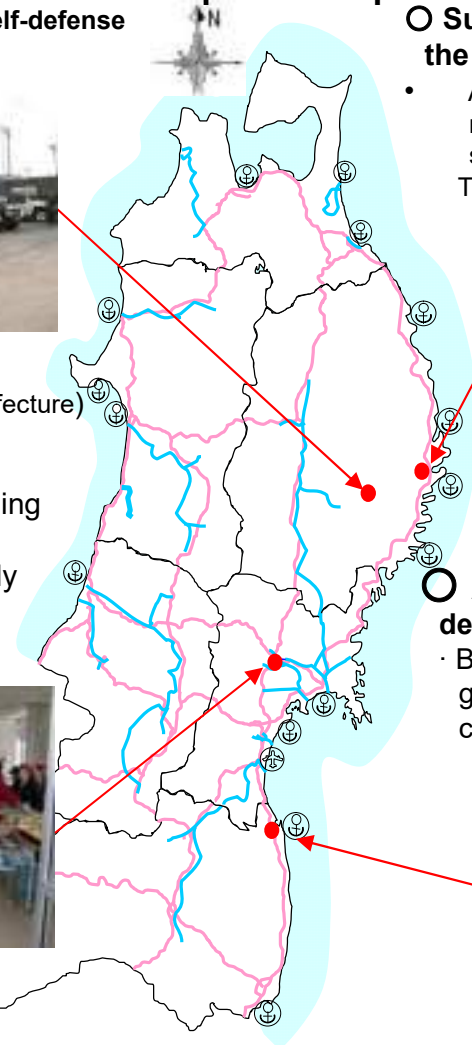
Yamada (Yamada-Cho, Iwate Prefecture)

○ A base to collect relief goods and deliver them to other places

- Being used as a relay point for relief goods arriving from all over the country



"Soma" (Soma-Shi, Fukushima Prefecture)



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Purpose of no pole pillarization

○ No pole pillarization is promoted from viewpoints of ① disaster prevention, ② safety and comfortableness and ③ landscape.

Enhance disaster
prevention performance



Secure safety and
comfortableness of traffic space



Good landscape fromation



Power pole collapsed by typhoon 21 in 2018

- Power poles were collapsed by storms, flying objects, fallen trees, etc.
- Road closers were caused by collapsed poles, and inhibition of recovery activities, damage of houses and vehicles took place.
- In addition, blackout of houses up to about 2.6 million happened due to distribution line breakages.

<Damage situation of poles>

- About 1,700 utility poles collapsed and broke, mainly in Osaka Prefecture.

< Number of poles collapsed by Typhoon 21 >

	Hokkai- do	To- hoku	Kanto	Hoiku- -riku	Cyu- -bu	Kinki	Siko- -ku	Total
Power	109	23	16	22	286	870	23	1,349
NTT	-	-	-	2	46	284	-	332
Total	109	23	16	24	332	1,154	23	1,681

《 Reference: number of telephone poles collapsed 》

- Typhoon 24: 117 poles
- Typhoon 25: 2 poles

※Survey by Ministry of Land, Infrastructure, Transport and Tourism

※Survey by each electric power company (as of Oct.5, 2018)
※NTT investigation (as of Sept. 26, 2018) (under investigation)
※In addition to the above, damage such as tilting, subsidence and cracking also occurred

<Power outage situation> (Power outage status

Sept. 5, 2018H30.9.5, 23:00 METI announcement)

- Maximum power outage: Approximately 2.6 million

(Equivalent to the total number of households in Hyogo Prefecture) Out of which about 1.7 million Kansai Electric Power (as of April 21)



[Shinnan, Sennan City, Osaka]



[Kaizu, Makino-cho, Takashima City, Shiga Prefecture]



[Koshiwada-cho, Kishiwada City, Osaka]



[Okubo-cho, Moriguchi City, Osaka]

Utility poles and wires that hinder the scenery

○ In Japan, pole pillarization has not been developed even around the World Heritage site.

Overseas



Peru, in front of Lima Cathedral

World
heritage



Quebec Historical District, Canada Silk mill

World
heritage

Japan



In front of the main gate of Tomioka Silk Mill



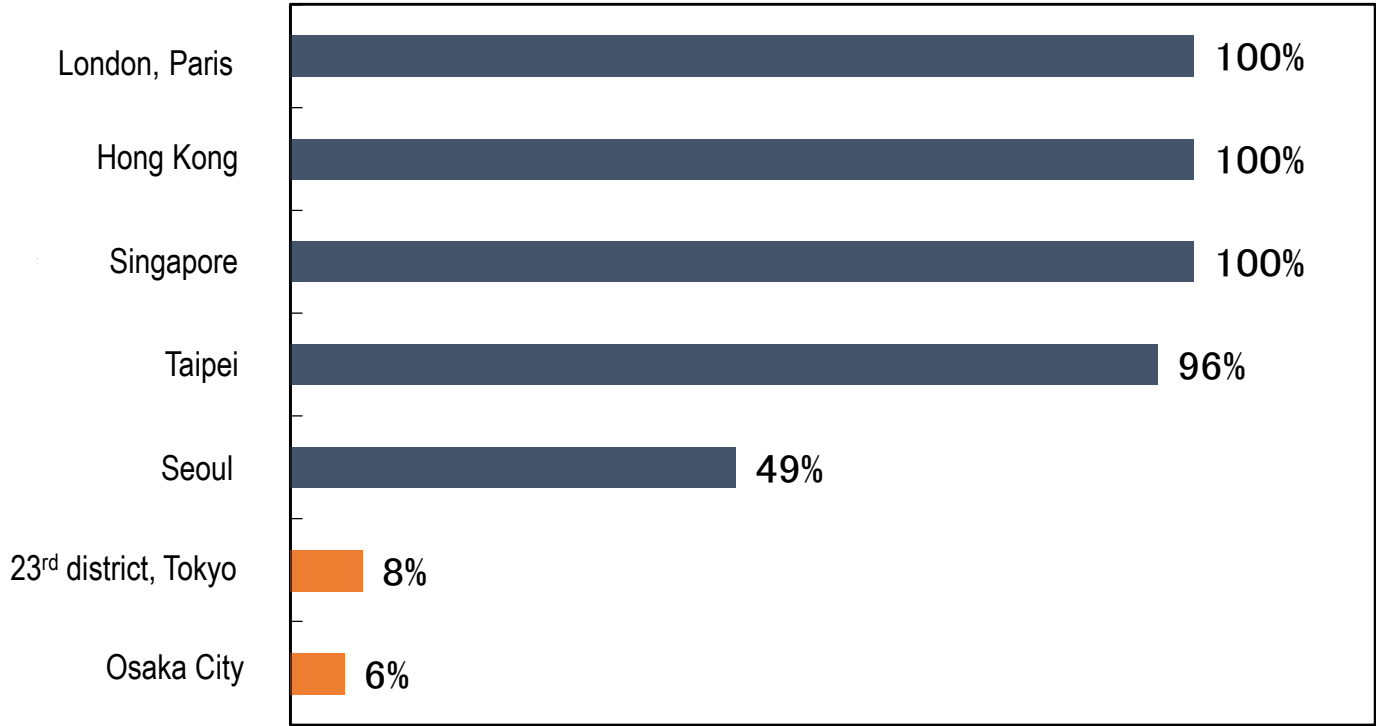
Road overlooking Mt. Fuji

※Created based on Street View

Development status of no pole pillarization (domestic and overseas)

○ In major cities such as London and Paris in Europe, and such as Hong Kong and Singapore in Asia, no pole pillarization has been already achieved. But Japan’s achievement rates are 8% in Tokyo's 23 wards and 6% in Osaka City.

【Current Status of Poles-Free Japan with Major Cities in Europe, America and Asia】



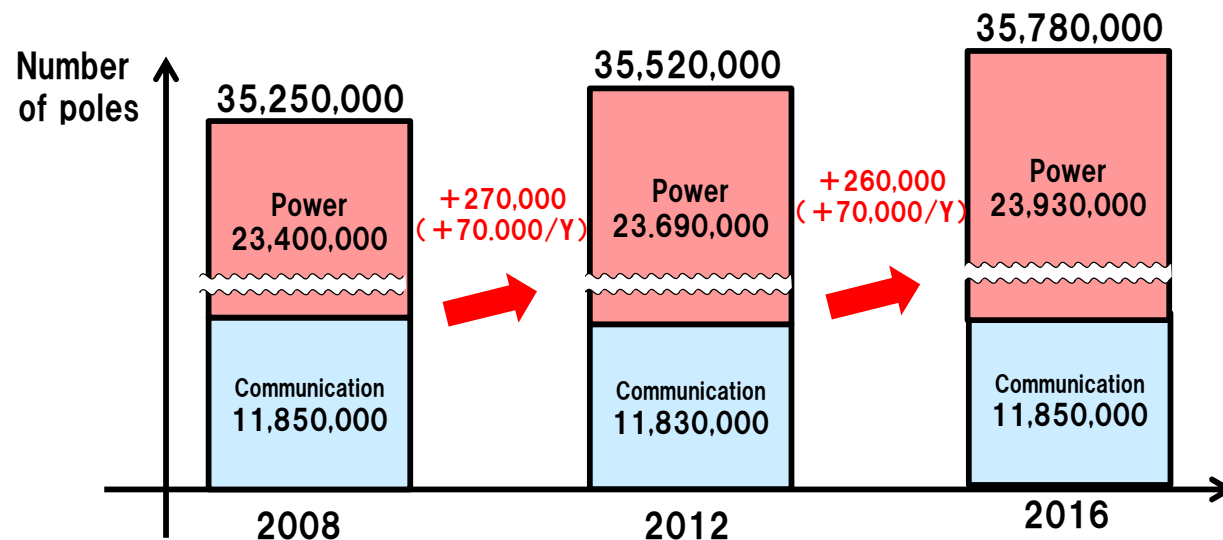
※1 Situations of London and Paris as of 2004 are based upon surveys by the Overseas Electricity Research Committee (based on extended cables)
※2 Situation of Hong Kong is based upon the survey in 2004 by the International Construction Technology Association (based on extended cables)
※3 Situation of Singapore is based upon “POWER QUALITY INITIATIVES IN SINGAPORE, CIRED2001, Singapore, 2001” (based on extended cables)
※4 2015, situation in Taipei City District by Taipei City Road Line Information Center (based on extended cables)
※5 Seoul, 2017 status by Korea Power Statistics 2017 (based on extended cables)
※6 Japan, in the end of fiscal 2017 by the Ministry of Land, Infrastructure, Transport and Tourism (based on extended cables)

Historical and Institutional Background

○ Transition of no pole pillarization

- 1952 【Road Law】 Subject to permission to use electric wires and power poles (**duty-bound use**)
On top of that, measures to be restricted by article 37 for certain roads
- 1986 Electric wire undergroundization plan (1st phase): Selected from Japanese CAB system, conduit method, direct buried method, etc.
- 1995 【Electric Wire Common Duct Law】 Promotion of the development of joint electrical wire common ducts in various special cases (limiting the use of electric wires and power poles)
- 2013 【Road Law Corrections】 Added important roads for disaster prevention to Article 37 restrictions
- 2016 【Act on promotion of no pole pillarization】 Promotion of control and removal of electric poles and electric wires, and technological development

Approximately 70,000 new telephone poles increase every year under compulsory use



- Communication obligation for use is specified due to certain public interest needs, such as the fulfillment of electrical demand.
- There are restrictions under Article 37, but they have not always been fully utilized.
- The external non-economic effects of power poles on road traffic have not been fully discussed so far.

Objectives

In order to secure damage prevention, safety, smooth traffic, good scenery, etc., concerning the promotion of no pole pillarization (※), policies should be carried out by establishing the promotion plans for basic concepts, national duties, etc. promptly and comprehensively for securing social welfare, improving people's lives and contributing to the sound development of the national economy

(※) To control installations on roads and remove poles or wires (limited to those supported by the pole) there by burying the electric wire underground or by using other methods.

Basic Principles

- 1. Promote no pole pillarization while deepening the understanding and interest of the people
- 2. Appropriate role sharing among national, local governments, and related business operators
- 3. Contributing to the formation of communities where local residents

National Responsibilities

- 1. Country: to formulate and implement measures related to no pole pillarization
- 2. Local government: to formulate and implement measures in accordance with the situation in the region
- 3. Business operators: To install or remove electric poles and wires on the road, and to develop technologies
- 4. People: to deepen understanding and interest and cooperate with measures for no pole pillarization

No Pole Pillarization Promotion Plan (MLIT)

To formulate and publish no pole pillarization promotion plans that set basic policies, periods, targets, etc.
(To consult with relevant administrative agencies, such as the Minister of Internal Affairs and Communications and the Minister of Economy, Trade and Industry, and to listen to the opinions of power suppliers and electric communications companies)

No Pole Pillarization Promotion Plan by Prefectures and Municipalities

To formulate and publish no pole pillarization promotion plans for prefectures and municipalities (mandatory efforts) (To listen to the opinions of electric power suppliers and electric communications companies)

Measures for promoting no pole pillarization

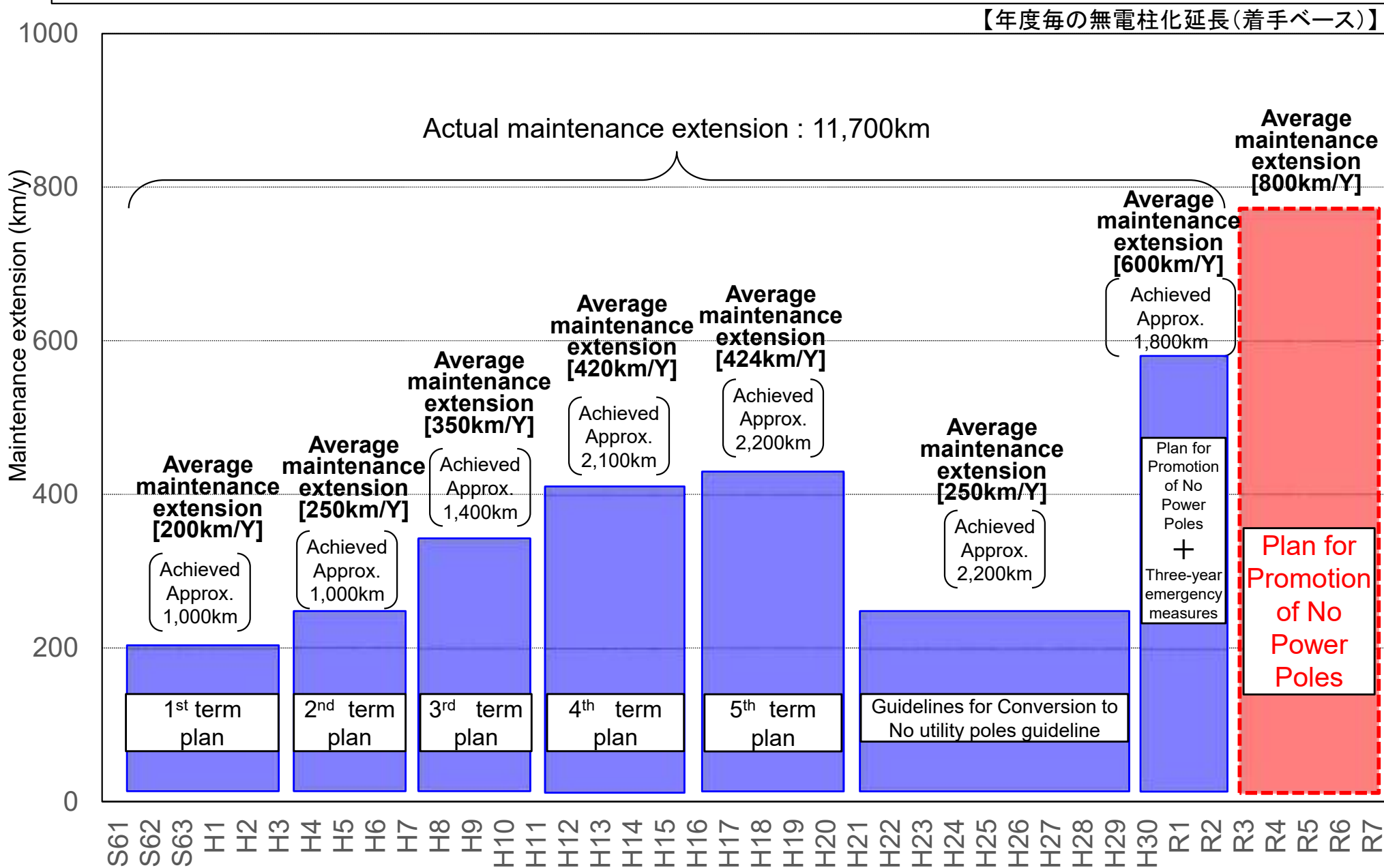
- 1. Public relations and awareness-raising activities
- 2. No-pole day (November 10)
- 3. Implementation of prohibitions and restrictions on exclusive uses of necessary roads by national and local governments
- 4. In implementing road projects and surface development projects, relevant business operators should construct new poles and electric wires on the road and remove existing poles and wires, taking into account the situation of these projects.
- 5. Research for promotion of no pole pillarization, promotion of technology developments, and dissemination of results
- 6. The government, local governments, related business operators, etc. should cooperate with each other for the construction of no pole pillarization.
- 7. The government implements necessary legislative, financial or tax measures and other measures.

※ Announcement and implementation: Dec. 16, 2016

※ Provisions for the burden of expenses of no pole pillarization (Supplementary Provisions, Article 2)

Changes in Maintenance Extension regarding No Utility Pole

- Total length of pole-free area from the 1st term plan to 2020 is approximately 11,700 km
- A new "Plan for Promotion of No Power Poles" will be developed, with a target period of five years from 2020 to 2025.



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1. Overview of Japan
2. Overview of Okinawa Prefecture
3. Policies Concerning Road Planning
4. Policies Concerning Road in Japan
5. Initiatives of Road Construction in Okinawa

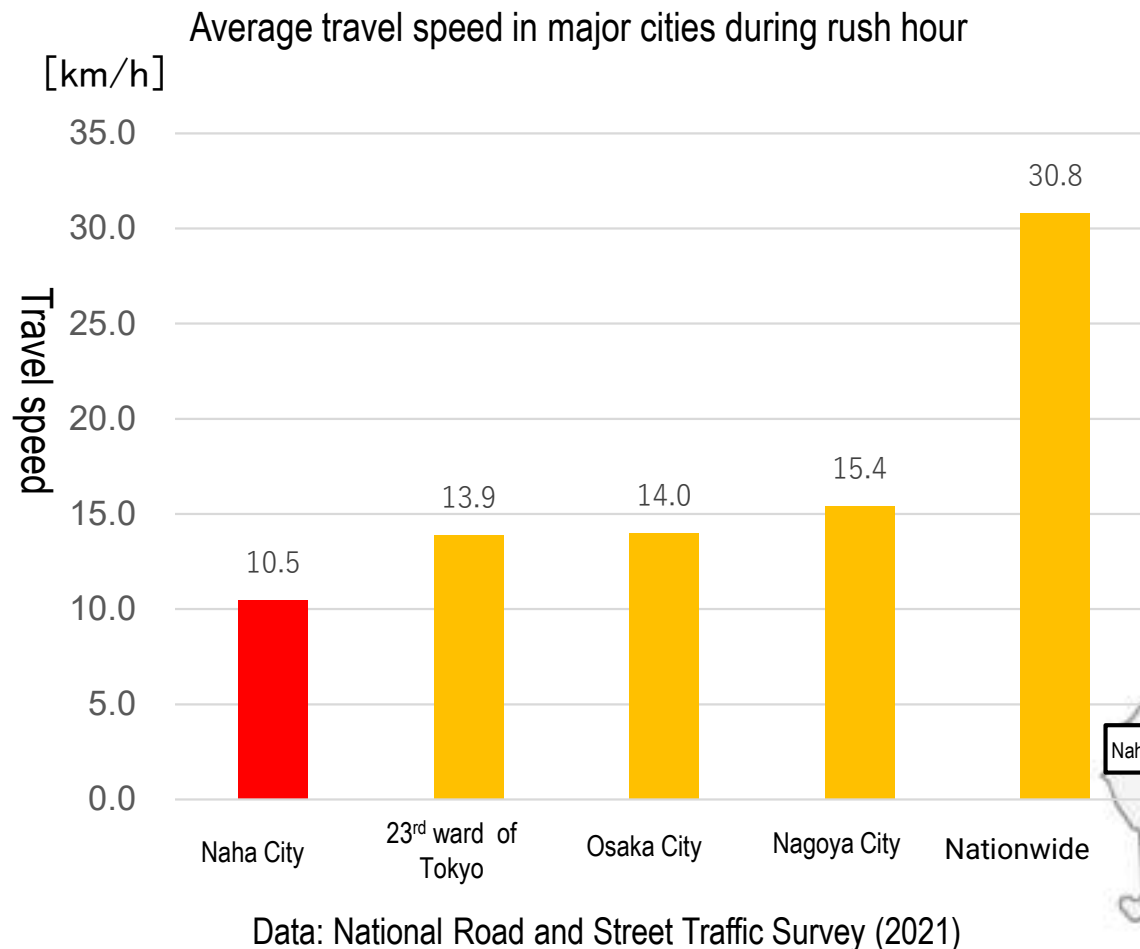
5. Initiatives of Road Construction in Okinawa

- (1) Measures to traffic congestion
- (2) Foreign rental car measures
- (3) Field operation tests of self-driving buses

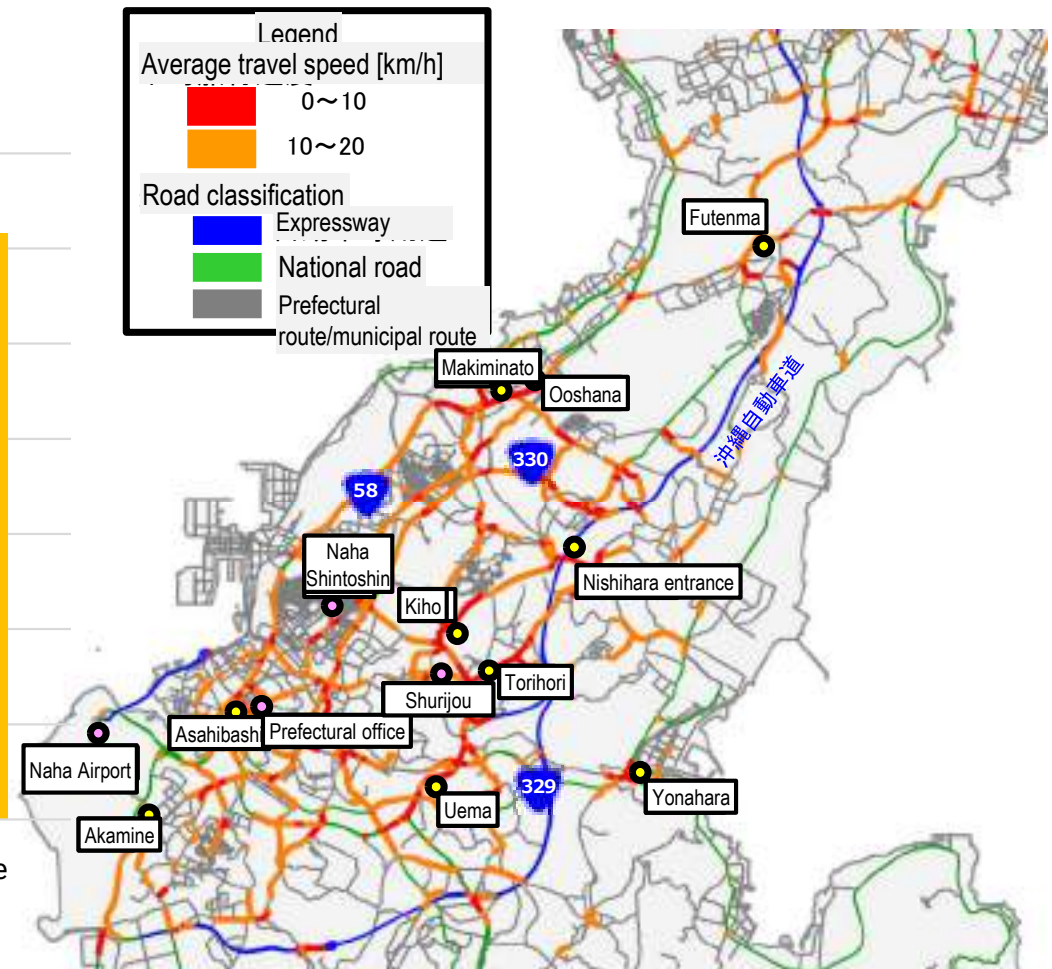
- (1) Measures to traffic congestion
- (2) State of congestion in Okinawa
- (3) Measures to congestion in Okinawa

Okinawa's traffic congestion is worst in Japan

- The average travel speed in Naha City during (morning and evening) rush hour is slower (more congested) than in Osaka or in any of the 23 wards of Tokyo; the worst traffic in the whole country.
- When the average travel speed in Naha and on the roads on surrounding areas is broken down by segment, it is clear that the majority of the segments on the general roads do not reach speeds of 20km/h, showing that there is congestion on various roads within the prefecture.

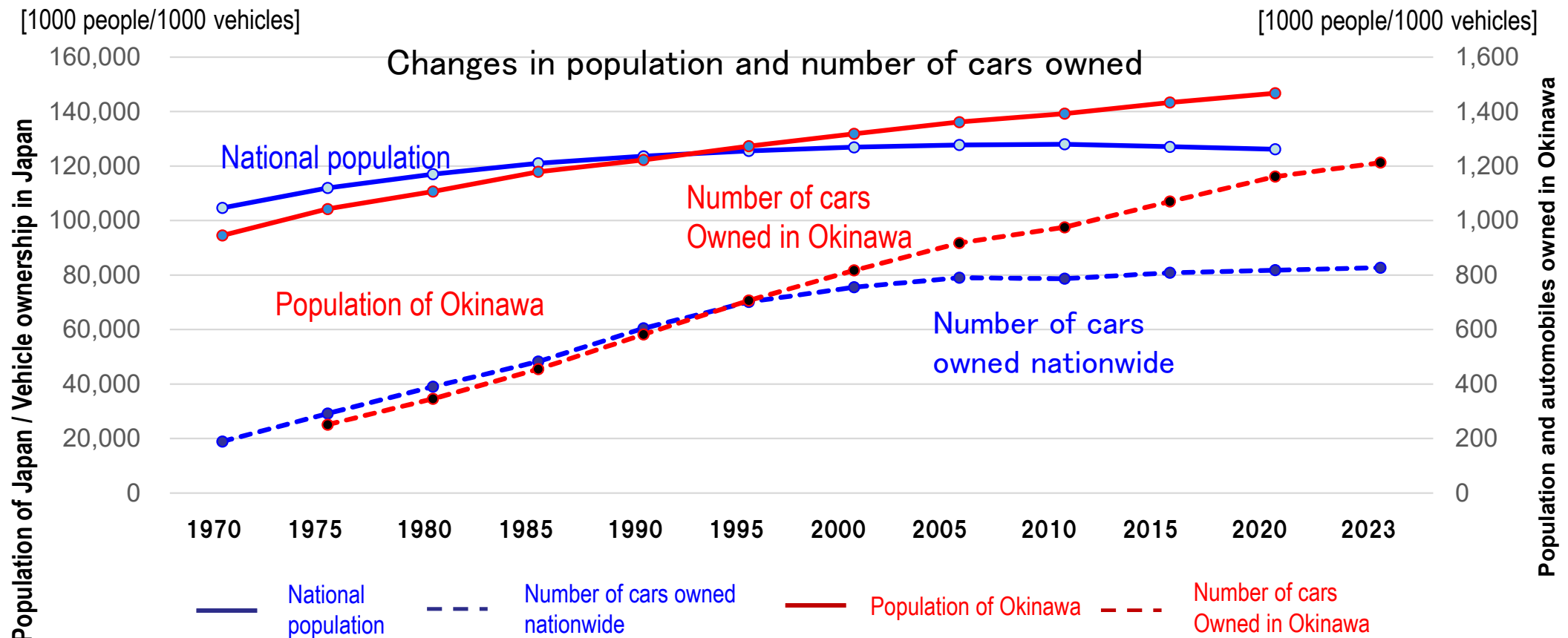


Average travel speed on national highways and prefectural routes by link (7 hour units)



Okinawa where people and cars continue to increase

- Looking at Japan as a whole, the population is declining and the number of automobiles owned has slowed, and in recent years it has been almost flat.
- Okinawa Prefecture is one of the few prefectures in Japan with a growing population, and the number of automobiles owned is increasing at the same pace as before.

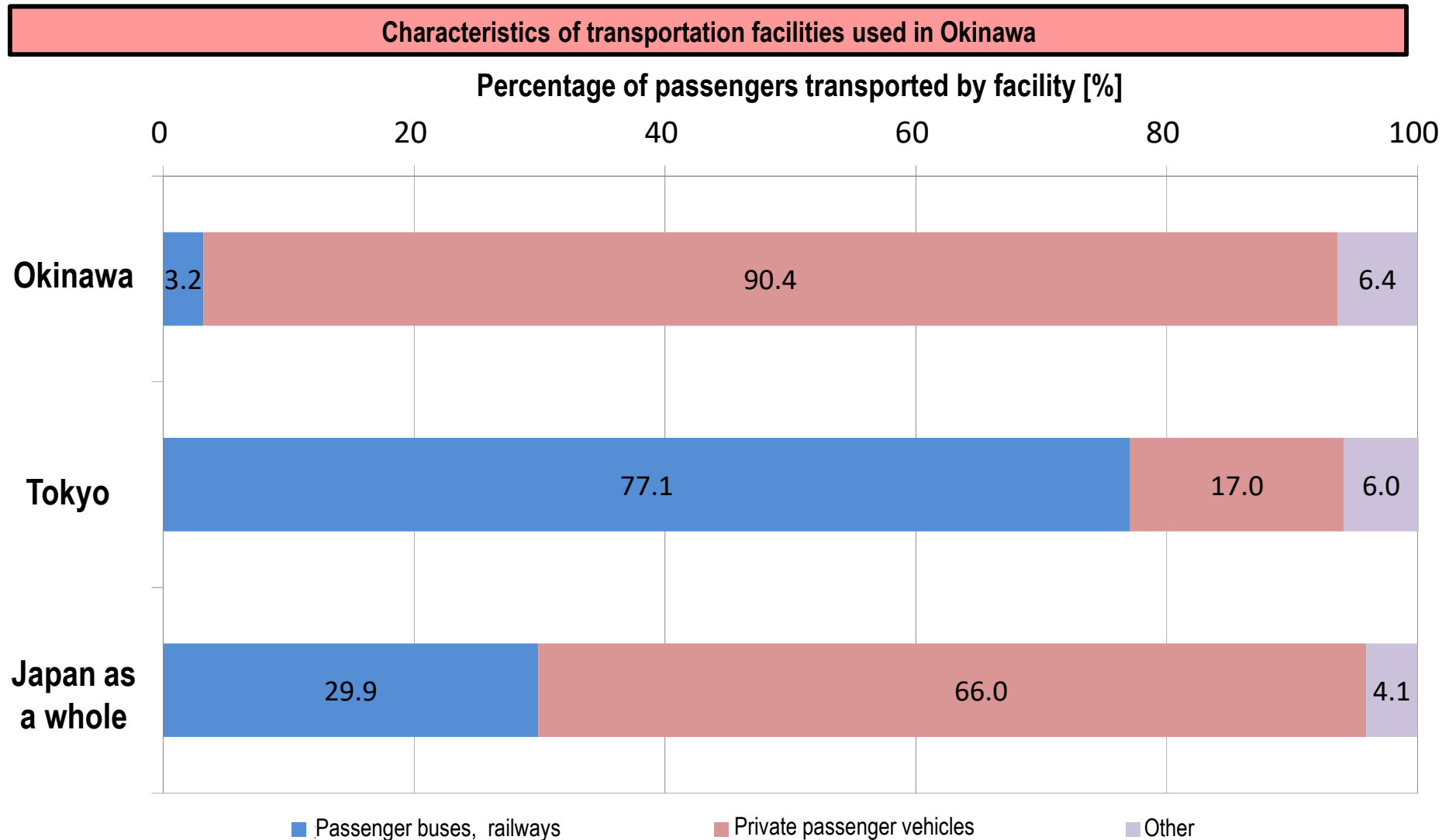


* The graphs of the population of the whole country and Okinawa prefecture are based on the results of the national census, so they are shown up to 2015.

Source: Census, Motor Vehicle Transportation Survey, and Japan Automobile Inspection and Registration Information Association

Okinawa has a high rate of vehicle use compared to the rest of the country

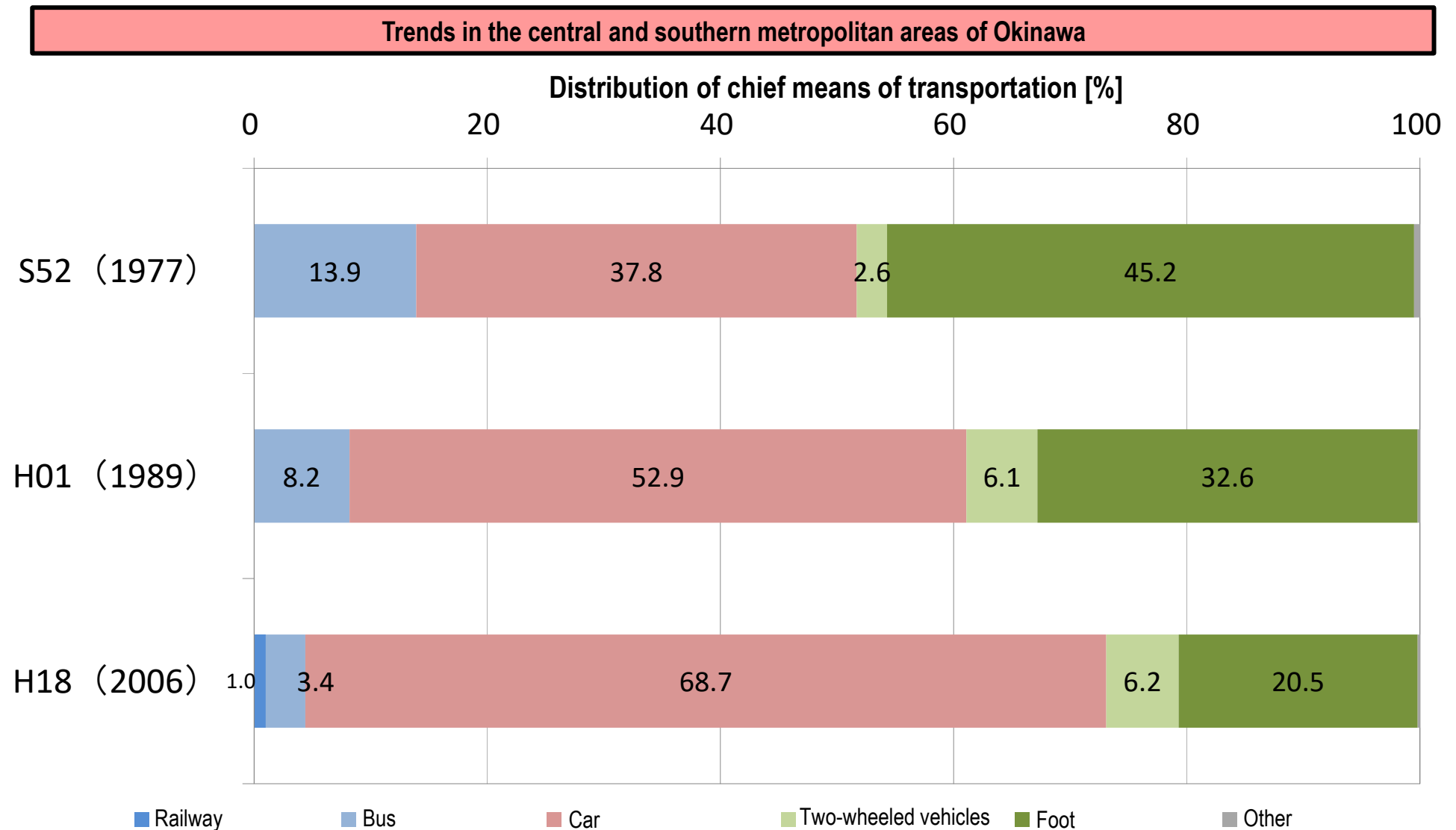
- Cars make up 90% of the transportation used in Okinawa. The rate of car usage in Okinawa versus in the rest of Japan is relatively high (percentage calculated by comparing the relative rates of use of buses, railways, private passenger vehicles, flying and passenger ships)



Source: Passenger area flow survey (2009)

The rate of car usage rises every year

- The rate of car usage as a means of transportation within the central and southern metropolitan areas of Okinawa increases every year and has risen dramatically within the past 30 years (by approximately 30 points).

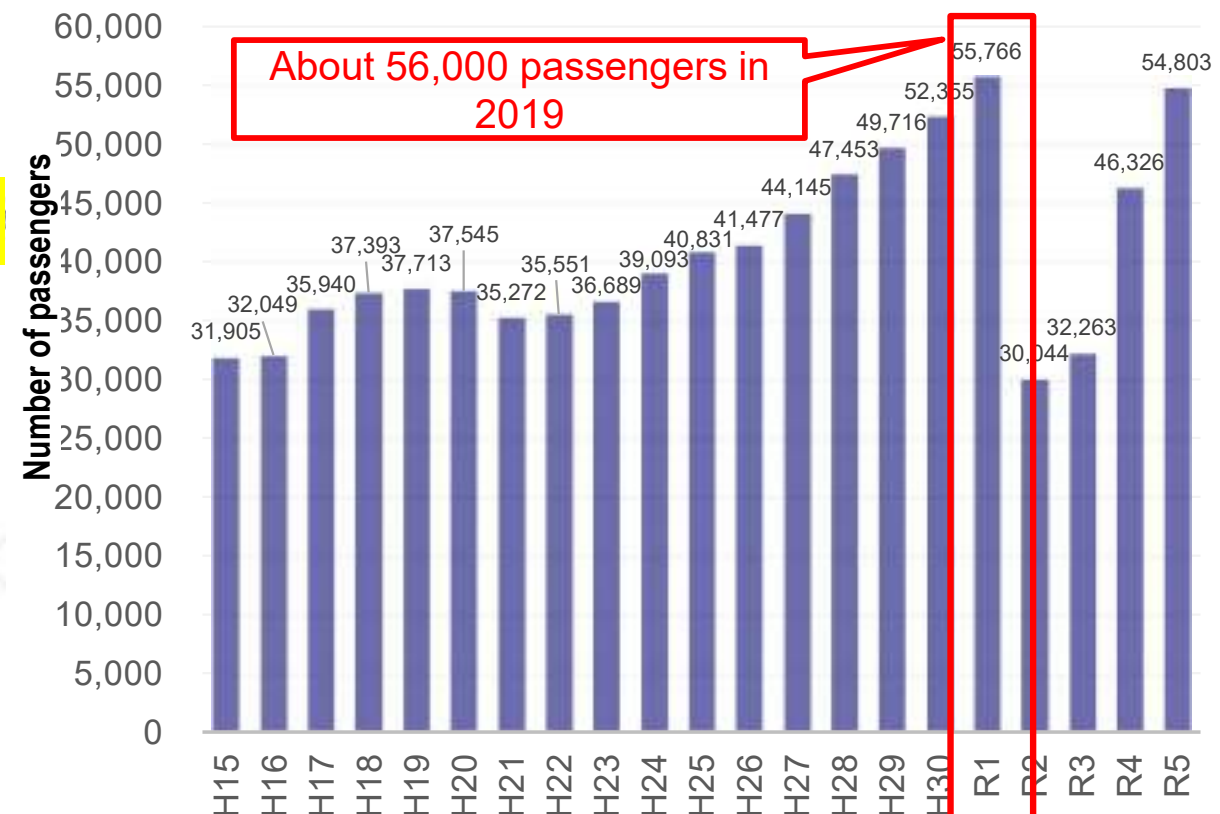


- The monorail system (commonly known as Yui Rail) connecting Naha Airport Station and Shuri Station has been used steadily since its opening in August 2003, with approximately 56,000 passengers per day in fiscal 2019.
- It has grown as new means of transportation in Okinawa Prefecture with the introduction of IC card tickets in October 2014 (use on local buses also started in 2015) and the opening of an extended route in October 2019.

Route Map of Yui Rail (as of October 2020)

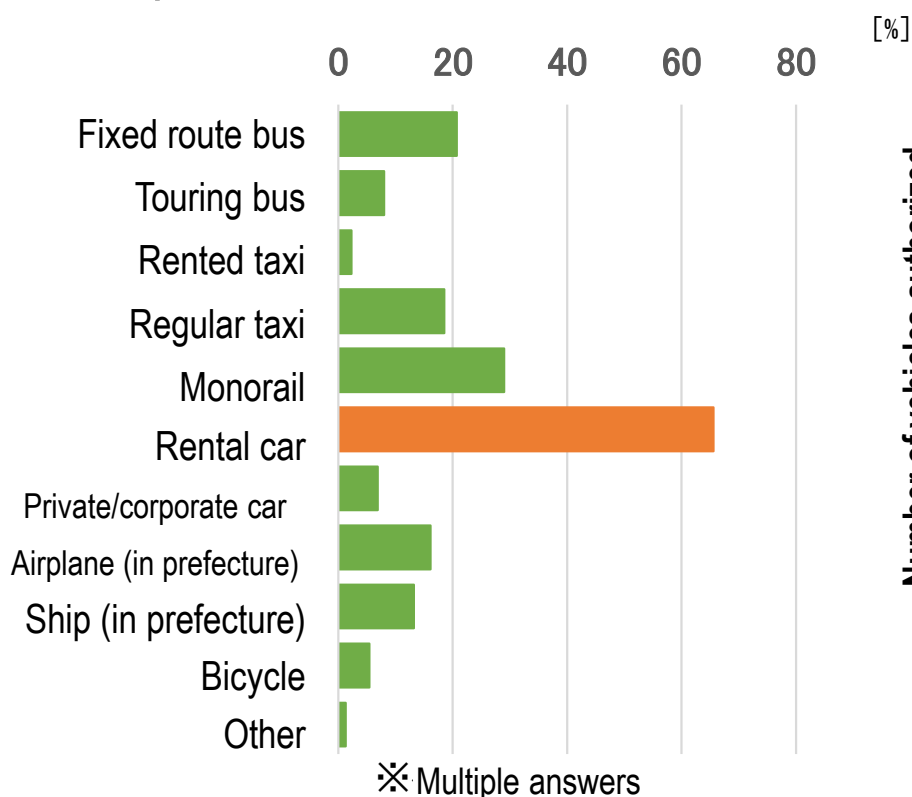


Average Daily Passengers of Okinawa Urban Monorail



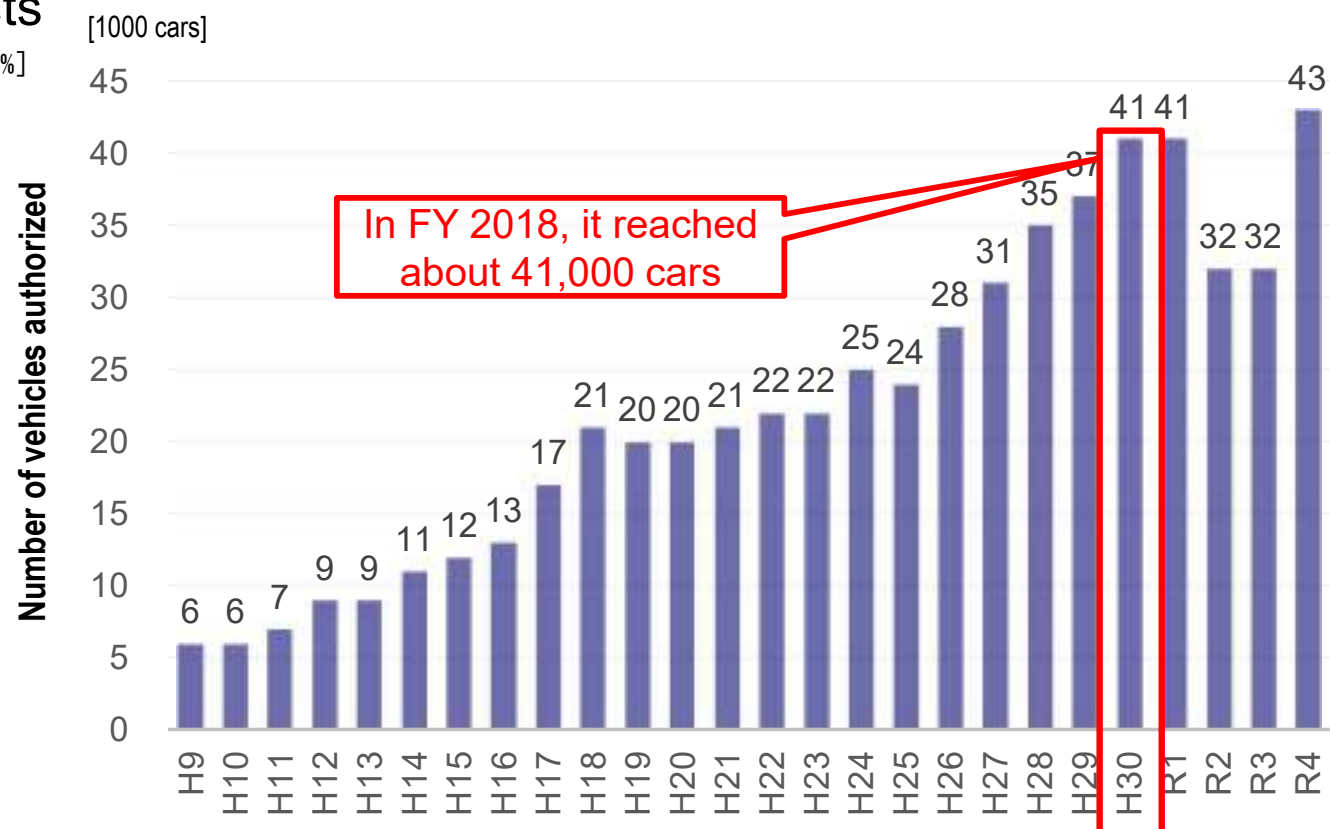
- Rental cars are the most common means of transport for visitors in Okinawa. Approximately 60% of tourists that visit the prefecture use them.
- The number of vehicles licensed as rental cars increases every year and exceeded 41,000 cars in 2018.

Transportation utilization rate of tourists



Source: 2022 Tourism Survey (Okinawa Prefecture)

Number of rental cars permitted in Okinawa Prefecture

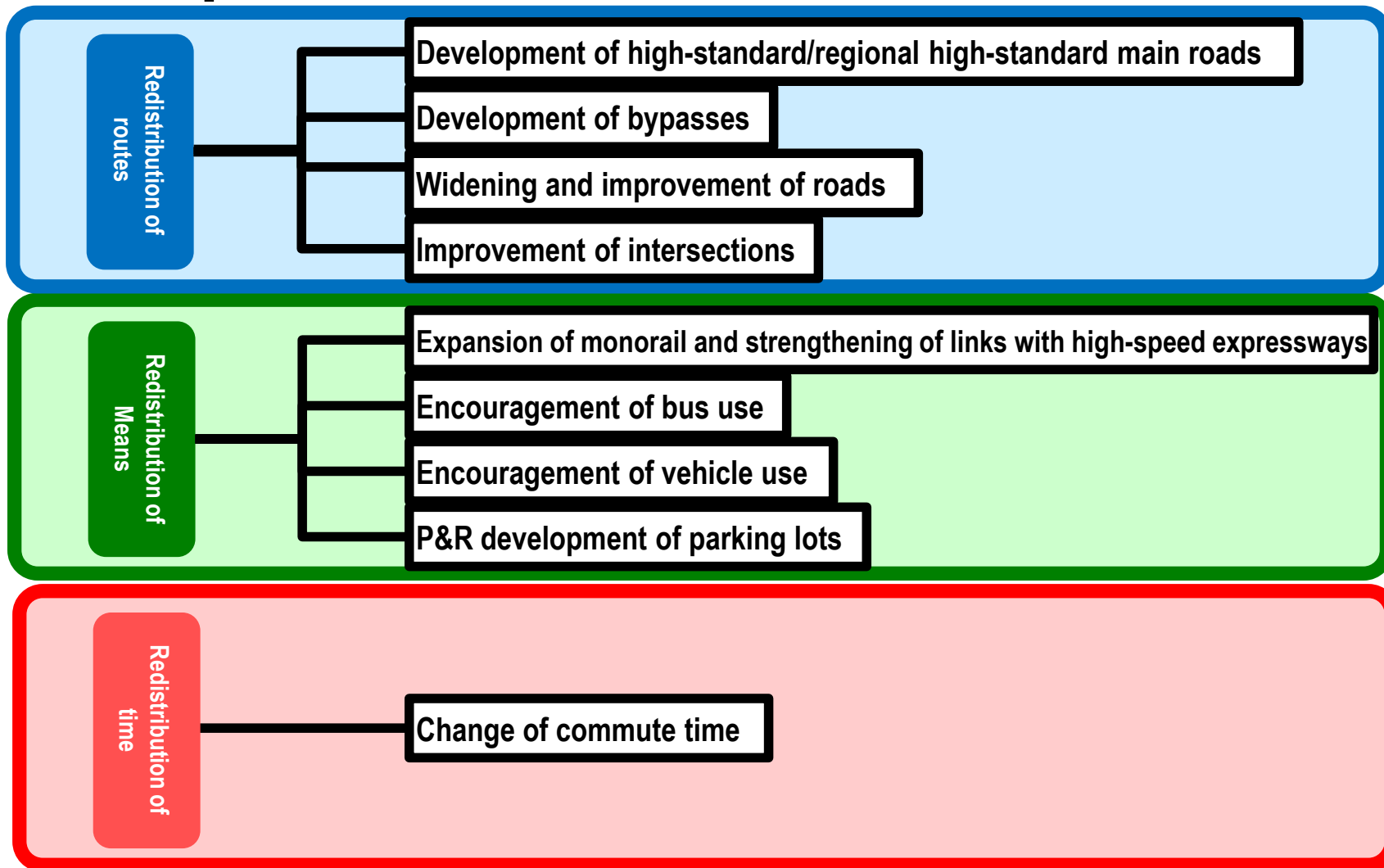


Source: Transportation handbook and business report 2022
(Okinawa General Bureau)

- (1) Measures to traffic Congestion
- (2) State of congestion in Okinawa
- (3) Measures to congestion in Okinawa

- In order to improve traffic congestion on Okinawan roads, it is important to develop the roads (i.e. increase capacity) and use the roads wisely by redistributing three main things: the means of transportation, the routes and the hours of usage time.
- The Great Watta Bus Experiment is an initiative that aims to varying the means of transport used and the times they are used.

[3 redistributions]

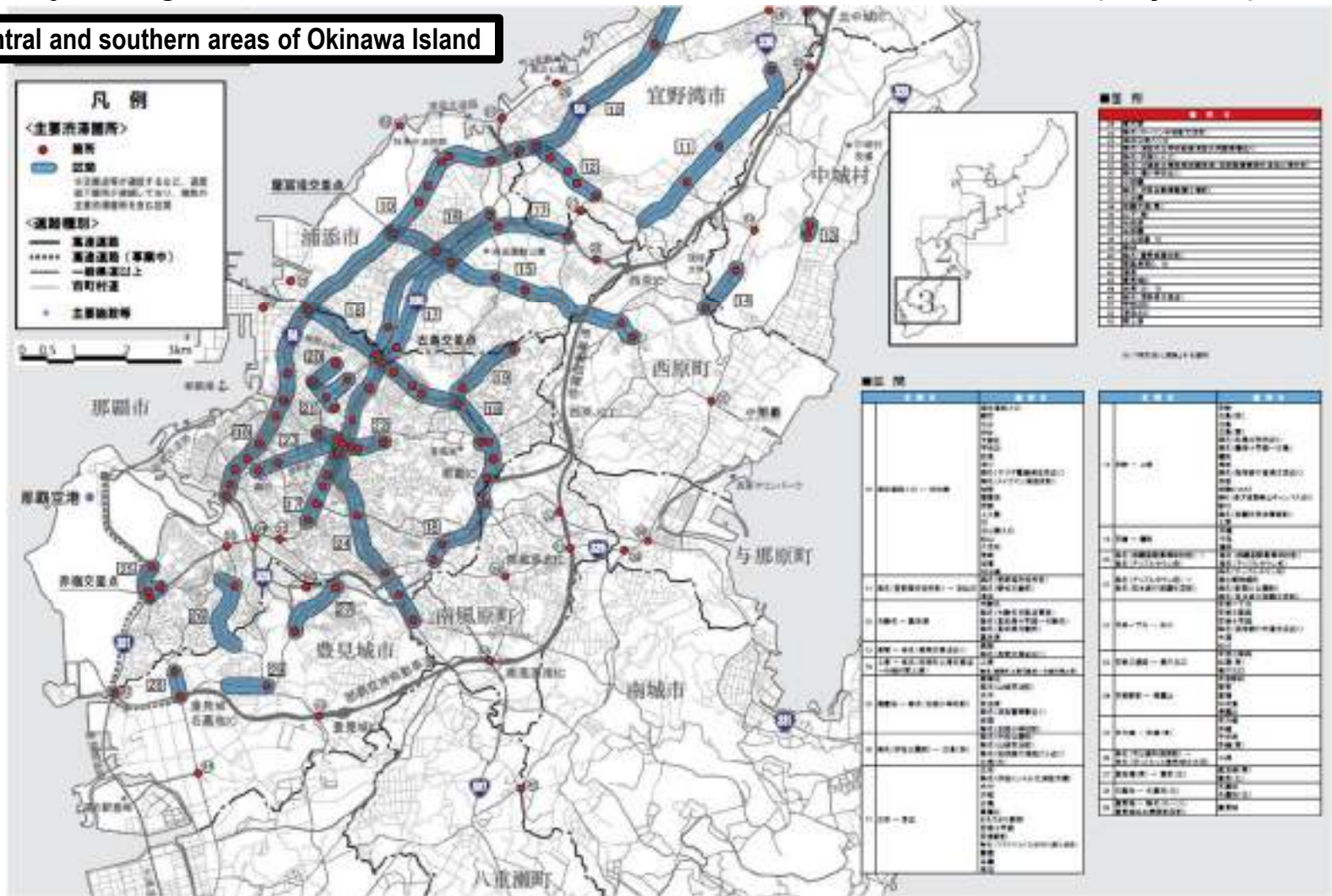


Major Congested Areas

- We determined the main congested areas based on the opinions of road users obtained through public comments and on the results of the analysis of big data concerning the traffic situation.
- We will work together with the relevant organizations and bodies to find solutions to these congested areas.

Major congested areas in central and southern areas of Okinawa Island (July 2024)

Central and southern areas of Okinawa Island



Initiatives aimed at reducing congestion and encouraging use of public transportation (developing main roads ①)

■ The 3 sturdy pillars that run from North to South

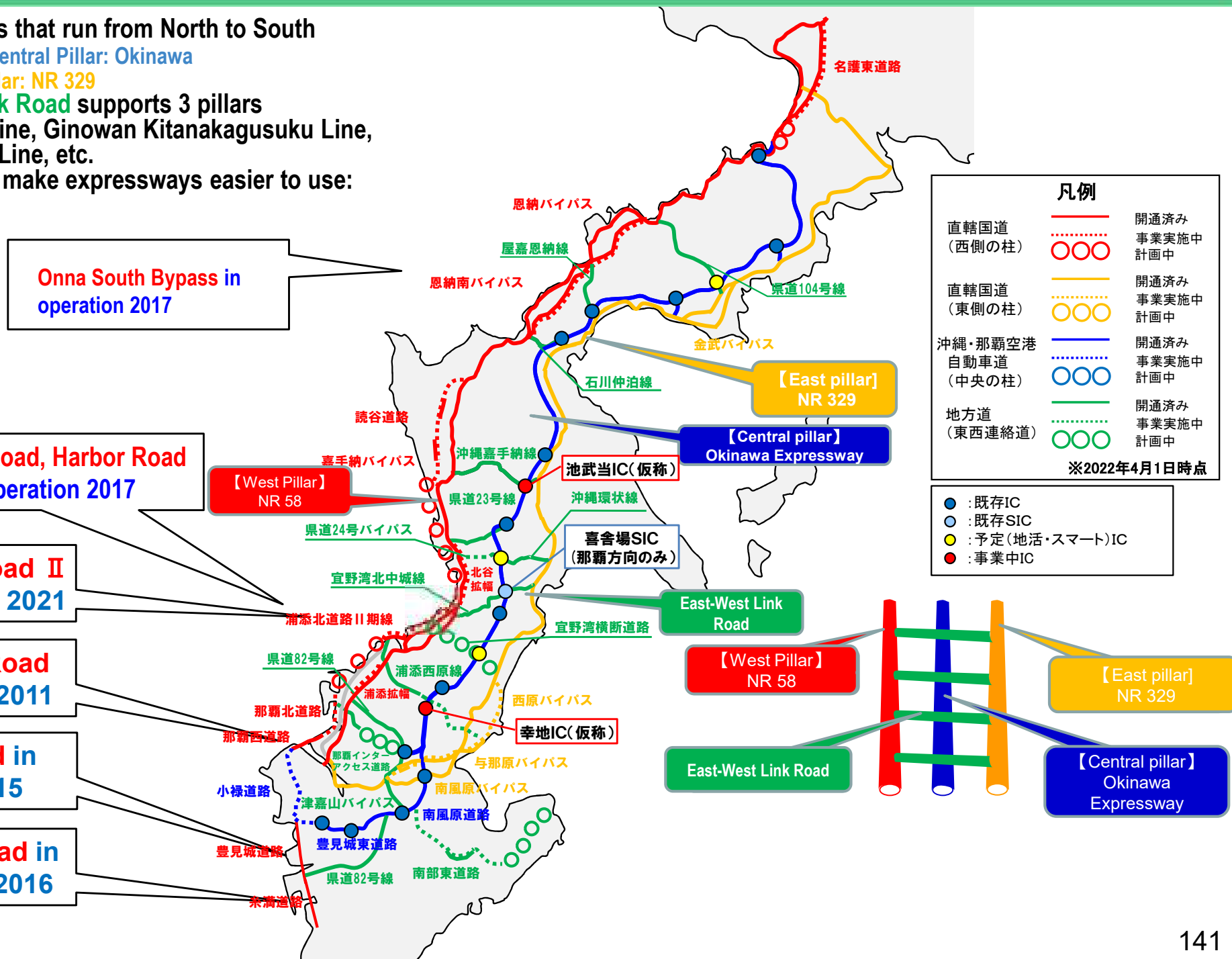
West pillar: NR 58, Central Pillar: Okinawa Expressway

Expressway, East pillar: NR 329

■ The East-West Link Road supports 3 pillars

Okinawa Katena Line, Ginowan Kitanakagusuku Line, Urasoe Nishihara Line, etc.

■ Interchanges that make expressways easier to use: Kishaba IC



2 ring and 7 radial roads

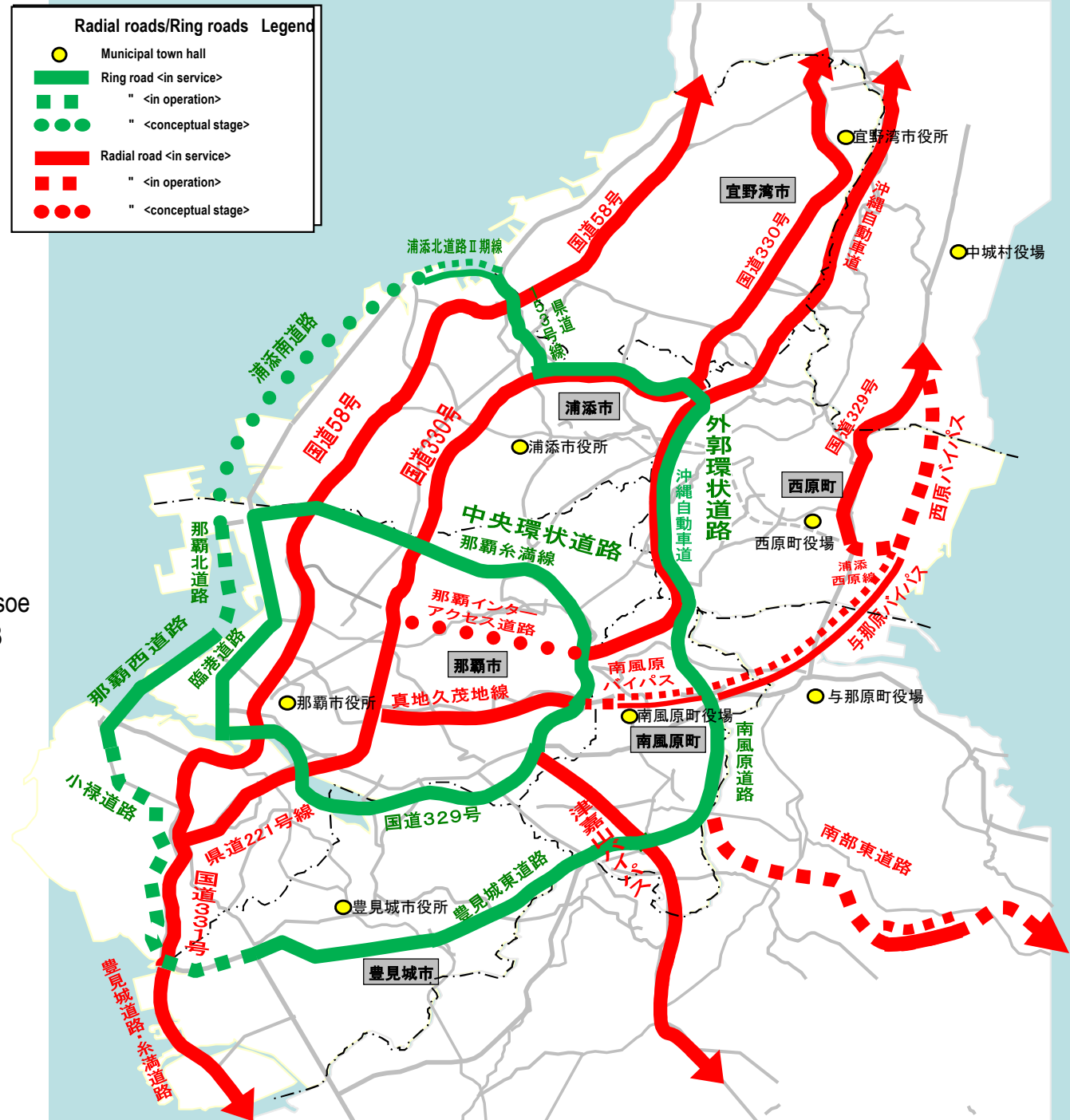
By developing a ring and radial road, we aim to disperse traffic routes and improve the travel speed (10.5 km/h) during congestion in Naha City.

[2 ring roads]

- ① Central ring road
Highway 329, Harbor Road, Prefectural road 82 (Naha Itoman line)
- ② Outer ring road
Highway 330, Okinawa Expressway, Naha Airport Expressway (Haeburu Road, Tomigusuku East Road, Oroku Road), Naha West Road, Naha North Road, Urasoe South Road, Urasoe North Road, Prefectural Route 153

[7 radial roads]

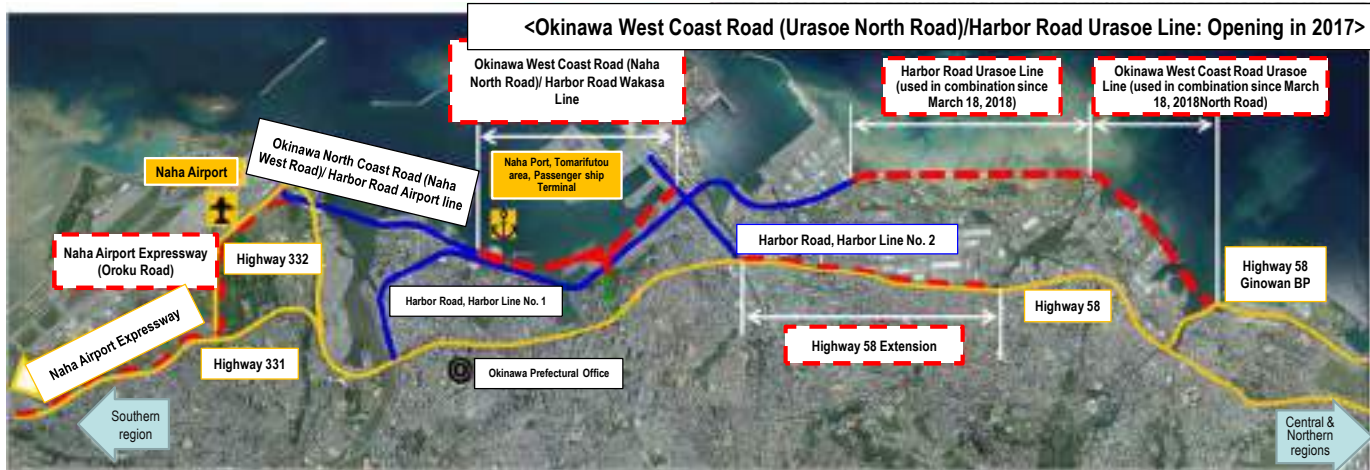
1. NR58
2. NR 330
3. Naha controlled-access highway, Okinawa Expressway
4. Prefectural road 222 line (Maaji Kumoji Line), Haeburu Bypass, Yonabaru Bypass, Highway 329
5. NR 507 (Tsukayama Bypass), South East Road
6. NR507 (Tsukayama Bypass)
7. Prefectural Route 221 line, Prefectural Route 331, Tomigusuku Road, Itoman Road



Okinawa West Coast Road (Urasoe North Road)

- The Okinawa West Coast Road (Urasoe North Road)/ Harbor Road Urasoe Line will form part of the “2 Ring Roads and 7 Radial Roads” project and will improve access to Naha Port and Naha Airport. By connecting with the Naha West Road/Harbor Road, they will also form a bypass from Naha Airport to Isa in Ginowan, which is expected to alleviate congestion on Highway 58.
- In August 2017 an elevated bridge was constructed at Makiminato. It was opened in March, 2018.

Development status of the Okinawa West Coast Road (Urasoe North Road)/Harbor Road Urasoe Line



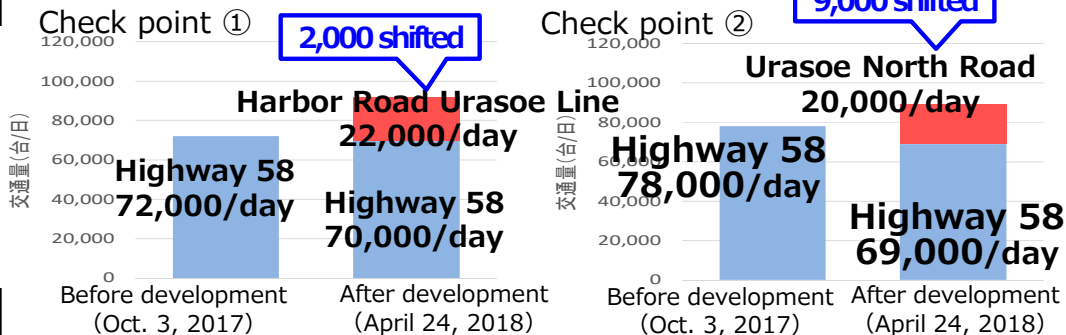
- Okinawa Westcoast Road (Urasoe North Road) and Harbor Road Urasoe Line have been used in combination since May 18, 2018.

○ The Urasoe North Road



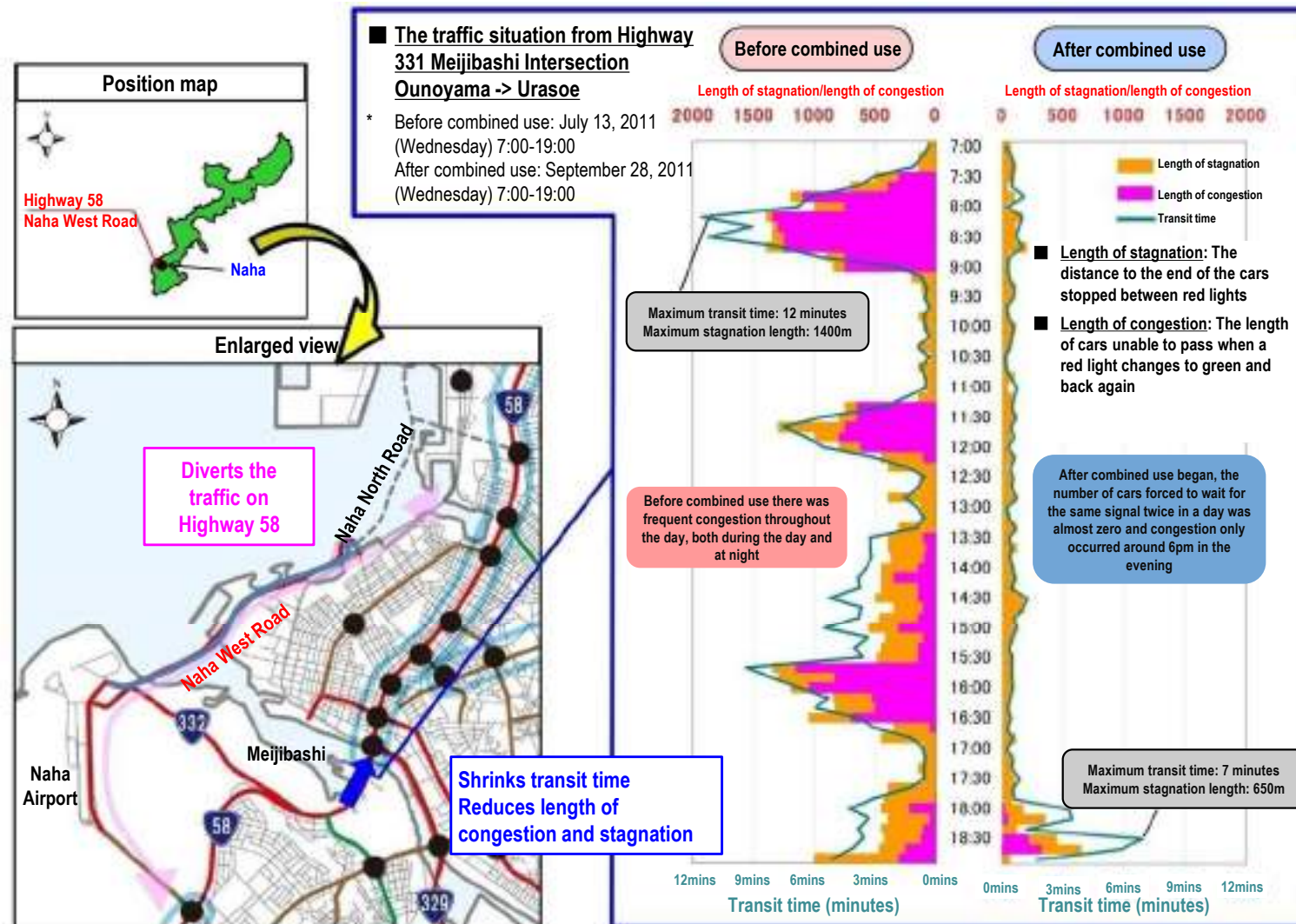
Traffic amount shifted to Urasoe North Road and Harbor Road Urasoe Line

Urasoe North Road: 20,000 vehicles/day observed
 Harbor Road Urasoe Line: 22,000 vehicles/day observed
Traffic of Highway 58 shifted to Urasoe North Road



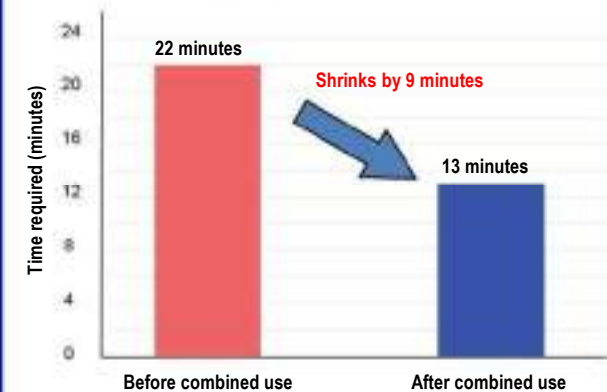
Naha West Road (from Wakasa to Kagamizu in Naha City)

○ Reduces transit times on Meijibashi Intersection on Highway 58 in Central Naha and helps shorten access times to Naha Airport



The traffic situation from Naha Airport -> Kokusaidoori

→ The maximum time taken to move from Naha Airport to Kokusaidoori shrank by 9 minutes

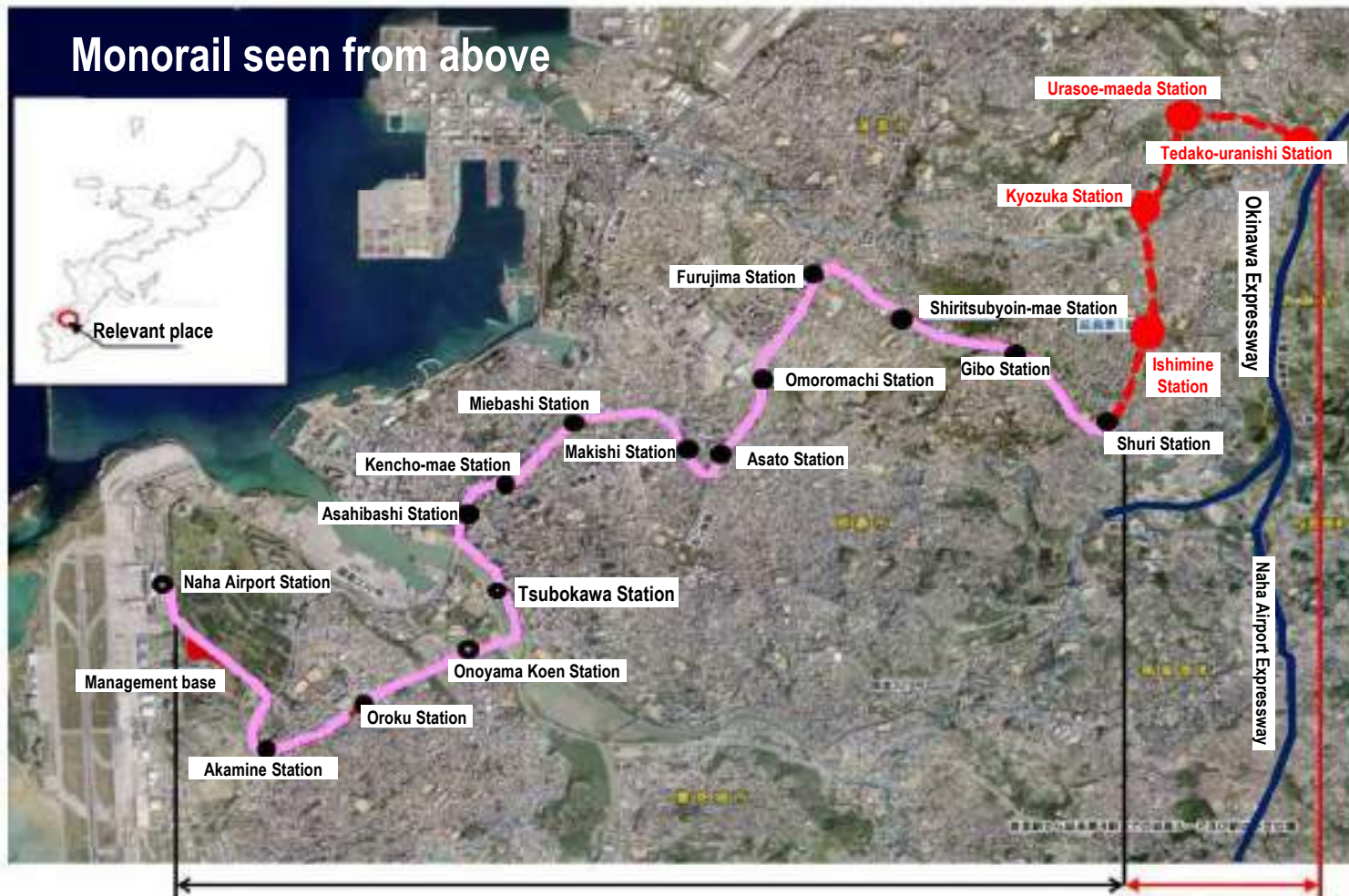


* Before combined use: July 13, 2011 (Wednesday)
After combined use: September 28, 2011 (Wednesday)
7:00am-19:00pm, Maximum travel time for each hour

Extension of Monorail

- The Okinawa Urban Monorail (nickname: Yui Rail) has been in operation since August 2003 as the first orbital transportation system in Okinawa prefecture after the war (19 stations between Naha Airport and Tedako Uranishsi, 17.0km, travel time 37 minutes).

Monorail seen from above



Development of nodes between highways and the monorail.
(Monorail and high-speed bus parks & monoride parks & bus ride)

Image of Tedako Uranishi Station to be completed



Image of Tedako Uranishi Station environs



<<Existing area opened for business (August 2003)>>
Naha Airport Station – Shuri Station (15 stations, L = approx.. 13km)

<<Section opened in October, 2019 >>
From Shuri Station to Tedako Uranishi Station
(4 stations, distance = about 4.1km)

Source: Okinawa City Monorail Pamphlet

Improving convenience

Introduction of the joint IC ticket

The Okinawa City Monorail and four major bus operators in Okinawa introduced the joint IC ticket card in April 2015.

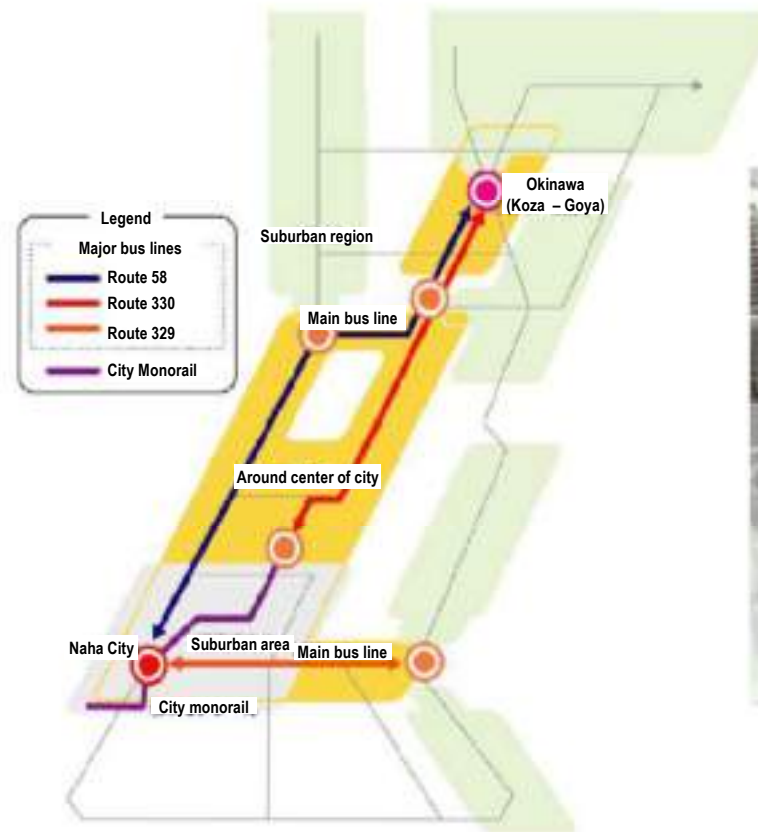
[The monorail first introduced it alone in October 2014]



IC ticket: name is "Okica"

Major bus concept

Plans are under way to introduce major buses that will run on Highway 58 (from Naha to Okinawa City) from 2019 in order to increase both punctuality and convenience. Matters such as the expansion of bus lanes are currently being worked on.



Redevelopment of Naha Bus Terminal Area

As part of the drive towards safe and comfortable urban development, transport node functions will be strengthened and to that end redevelopment work on the bus terminal area is in progress.

The bus terminal is on the first floor. It opened in October, 2018.



○With the opening of Naha Bus Terminal (opened on Oct. 1, 2018), we expect to increase the number of passengers for buses and monorail (Asahibashi Station) due to the improvement of convenience.



【What is provided?】

○ Real-time information about departure, arrival and delay time



のりば	番	行	発着時刻
1	先発 [90]	知花線	9:05
2	先発 [43]	北谷線	9:23
3	先発 [28]	読谷線	9:02
4	先発 [63]	謝花線	9:00
5	先発 [77]	名護東線	9:01
6	先発 [40]	大里線	9:10
7	先発 [37]	那覇新開線	9:13
8	先発 [6]	那覇おもろまち線	9:10
9	先発 [98]	読大線	8:45
10	先発 [89]	糸満線	8:55
11	先発 [111]	高速バス	8:56

○ Transit information to tourist attractions

Select destinations (tourist attractions)
→ transit information

Multi-language selection



■ Main Express Bus

○ As part of the main express bus initiatives, the current express bus and the limited express bus are unified to start the operation of the “main express bus” with excellent speed.

1 Start of operation

○ Full-scale operation October

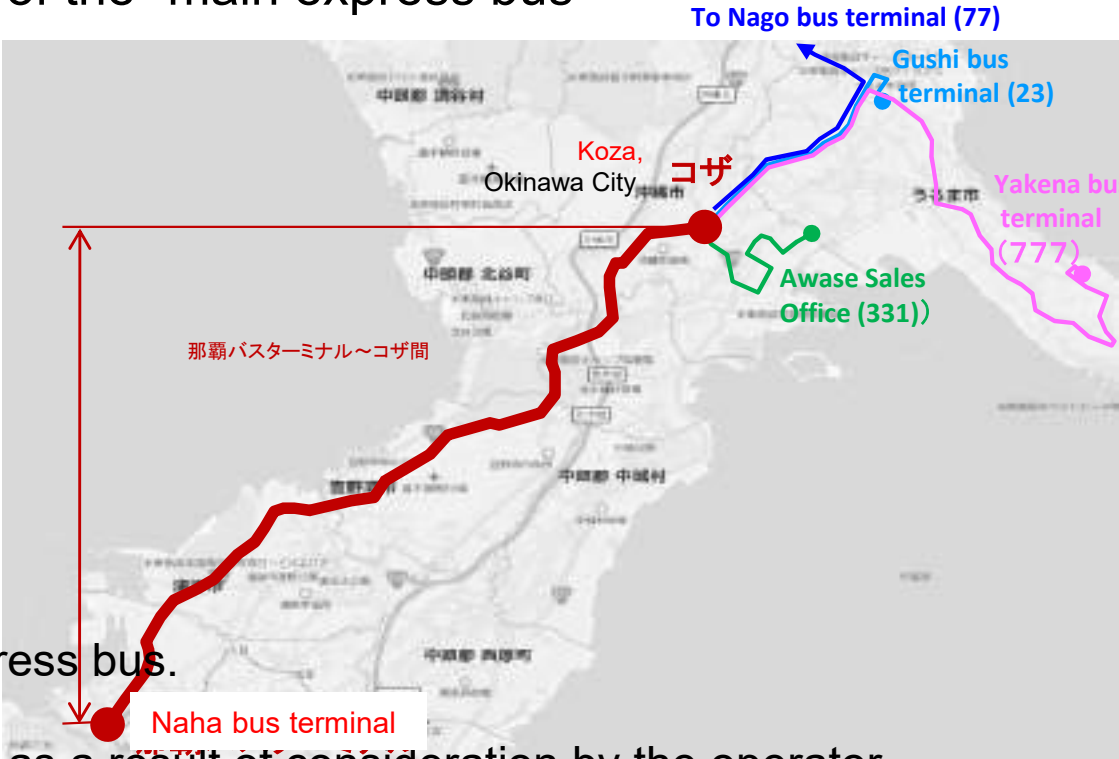
2 Operation schedule

○ Basic schedule is based upon the current “express bus” and “limited express bus.”

3 Stop-bus stop

○ The “main express bus” will also be unified for the stop-bus stop.

- Add "Shinjo" to the current express bus stop.
- Add "Higa Nishihara" to the current limited express bus.
- Currently, only limited express buses stop at the Wakamatsu Entrance, which is not stopped as a result of consideration by the operator.

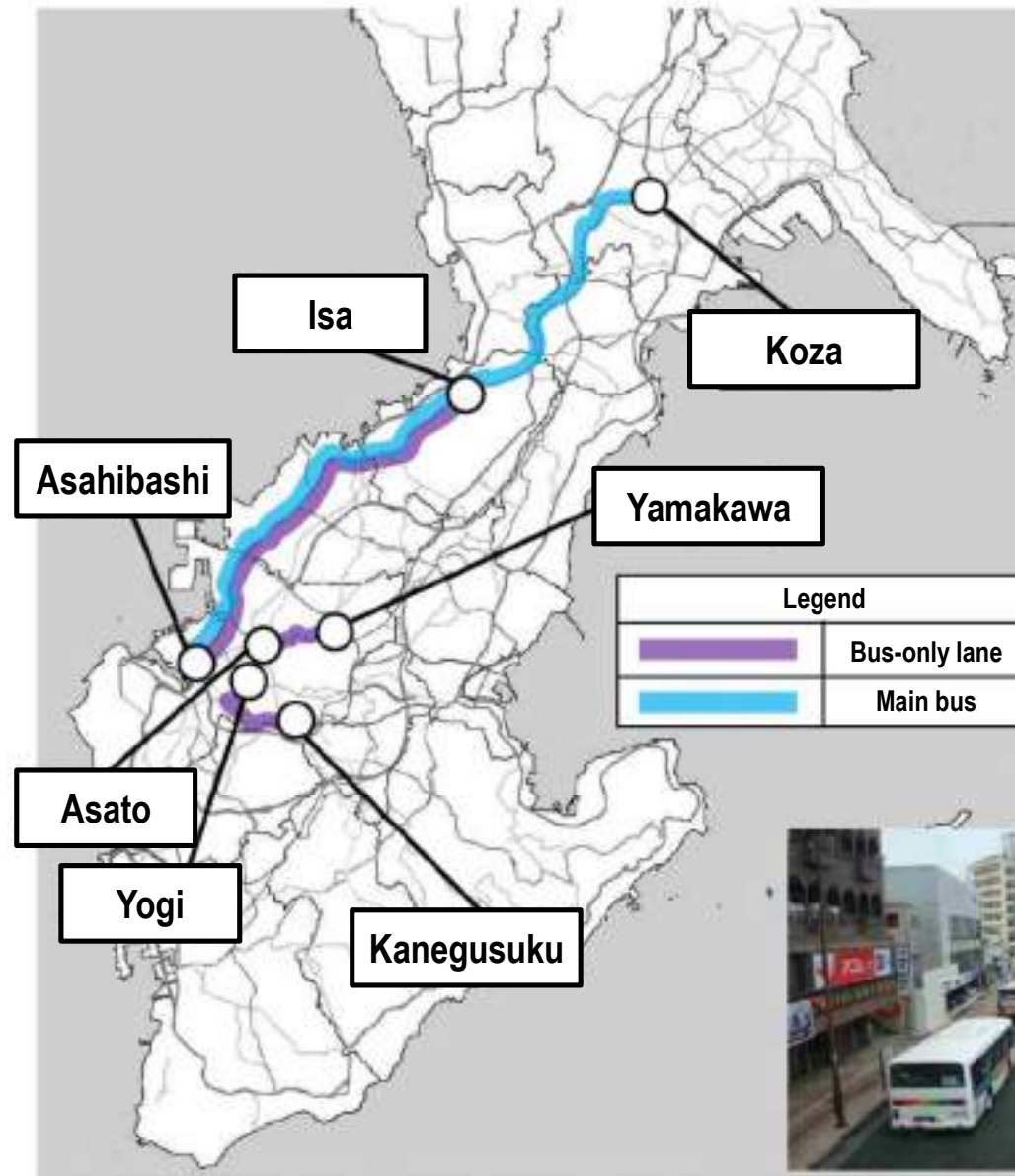


停車バス停名	那覇BT	県庁北口	農林中金前	若松入口	泊高橋	上之屋	第二城間	宇地泊	伊佐	新城	普天間	比嘉西原	山里	中の町	胡屋	コザ	合計
急行バス(現行)	○	○	○	—	○	○	○	○	○	—	○	○	○	○	○	○	15
特急バス(現行)	○	○	○	○	○	○	○	○	○	○	○	—	○	○	○	○	15
基幹急行バス	○	○	○	—	○	○	○	○	○	○	○	○	○	○	○	○	15

※【○】 Stop-busstop

Extension of bus lanes

- Set up bus-only lanes on major routes to ensure the speed and reliability of fixed route buses during morning and evening rush hour periods.
- Consider an extension of the routes up to Koza for a major bus system with Highway 58 as its center.



<Bus lane Implementation Status>

Bus lanes began to be extended from February 2, 2015

Extended distance (Highway 58)	North: 2.2km -> 6.8km (extended by 4.6km) (Kumoji, Naha – Ameku, Naha) South: 8.8km -> 10.4km (extended by 1.6km) (Isa, Ginowan – Kumoji, Naha)
Results of development (Highway 58)	Time taken going north: 44.7 minutes (8.1 minutes less) (Asahibashi, Naha -> Isa, Ginowan) Time taken going south: 43.8 minutes (4.1 minutes less) (Isa, Ginowan -> Asahibashi, Naha)

Since October 3, 2016 field tests involving express buses have been under way (with a reduced number of bus stops)

<Highway 58 Urasoe Gusukuma>

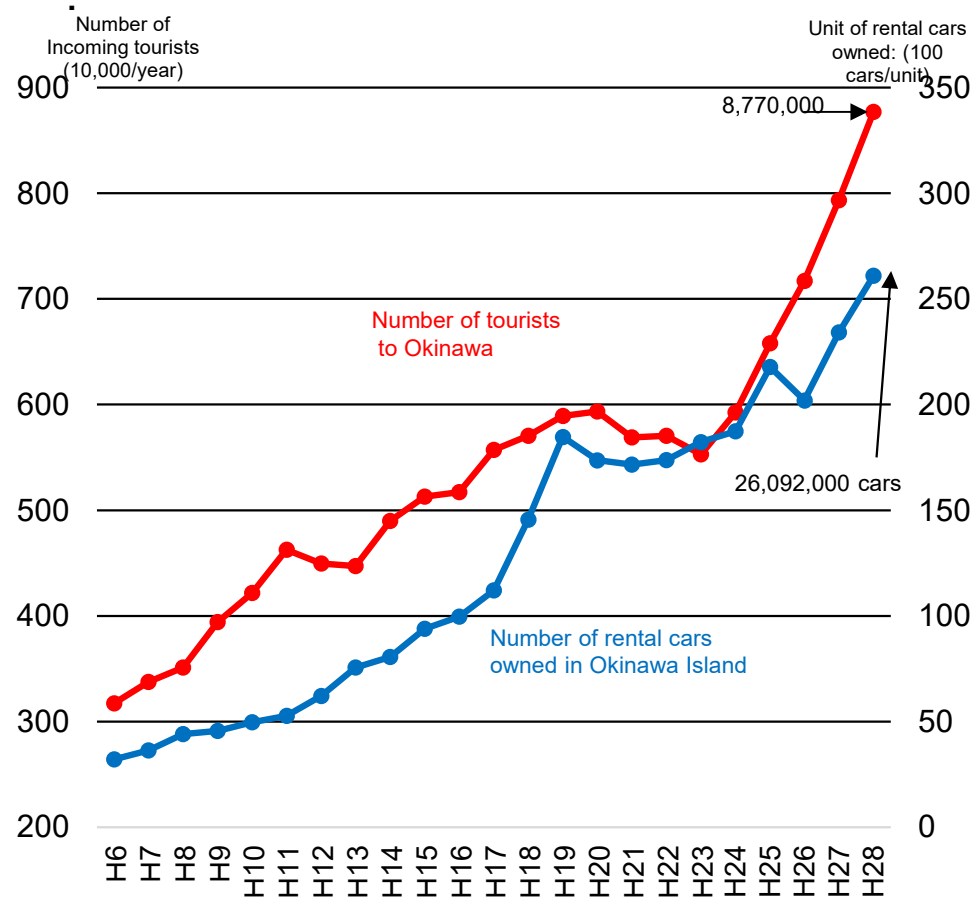


5. Road development initiatives in Okinawa

- (1) Measures to traffic congestion
- (2) Foreign rental car measures
- (3) Okinawa-ART

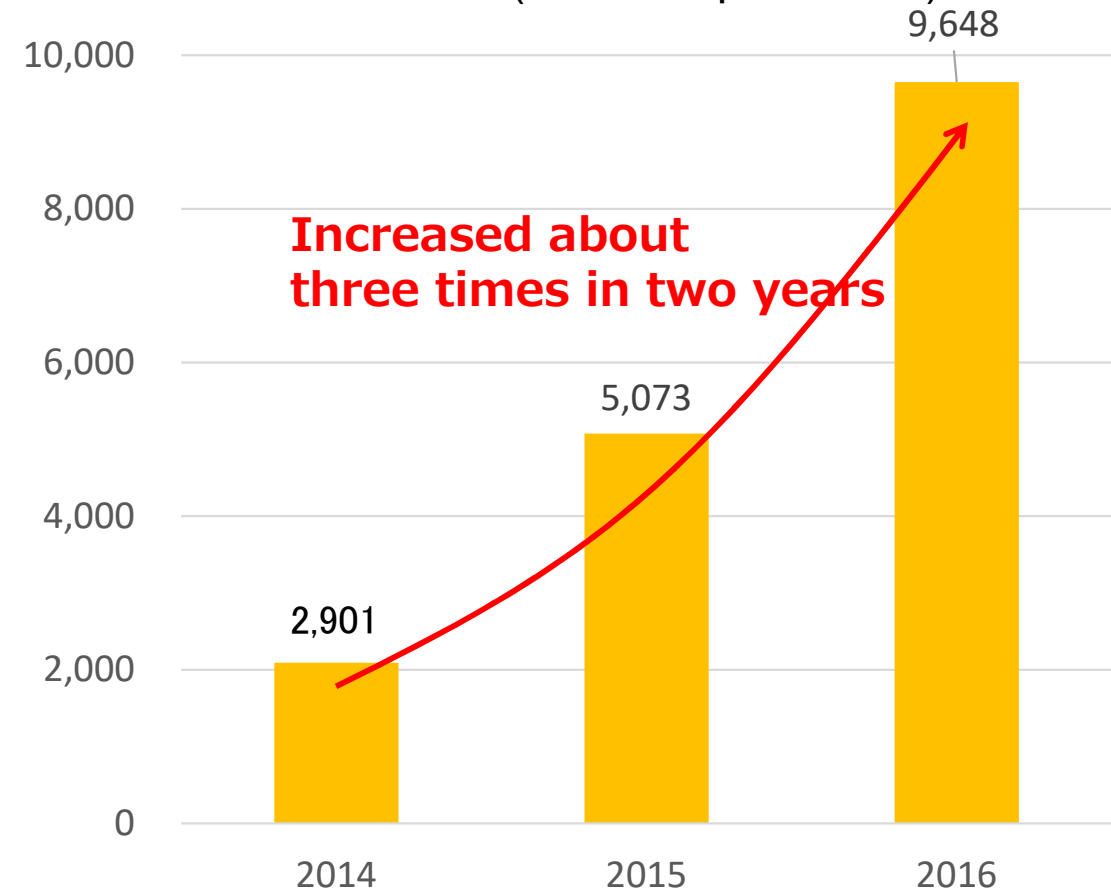
○ The number of accidents caused by foreigners driving rental cars has been increasing significantly.

◆ Rental cars: Means of transportation (about 60%) of tourists



Transition of the numbers of incoming tourists and rental cars
Materials: Transportation Directory, Arrival Tourists Statistical Overview

◆ Number of accidents caused by foreign rental car drivers (Okinawa prefecture)

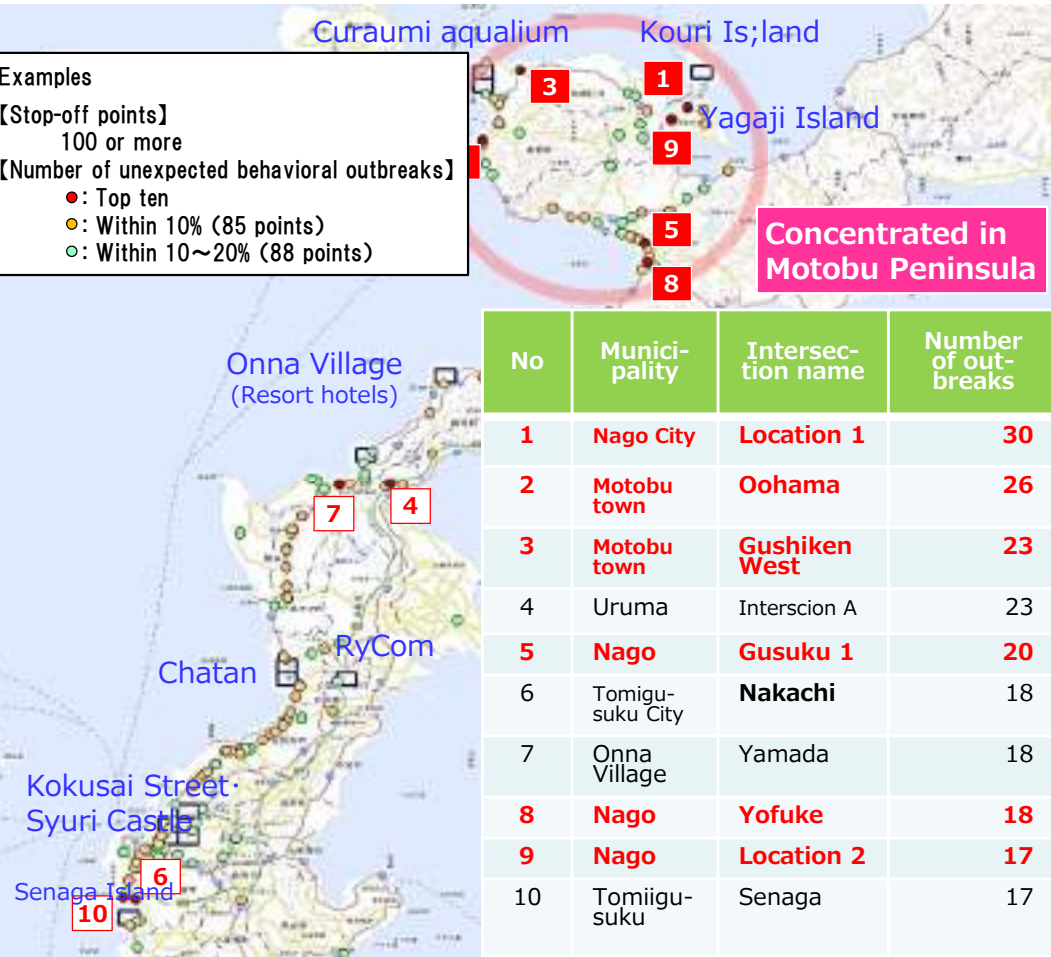


Source: Okinawa RENT-A-CAR ASSOCIATION

Identify characteristics of risky points where foreigners are likely to get involved in accidents

- Pay attention to **Motobu Peninsula** with worst high-ranking intersections where many unexpected behaviors by tourists can be observed.
- We compared the percentage (case/1,000 cars) of unexpected behavioral outbreaks per the number of running cars driven by foreigners with that by Okinawan people, identified the “Gushiken West” and “Location 1” intersections as risky points specific to foreigners, and since that we have studied pinpoint countermeasures.
※ **Warning signboards were installed at three target intersections on June 11, 2018.**

Tourist stop-off and unexpected-behavioral-generation points



Risky points specific to foreigners

Inter – section names	Foreign tourists (ETC2.0 Probe: May – December, 2017)			Okinawan people (ETC2.0 Probe : April – October, 2017)		
	Number of un-expected behaviors	Number of running cars	Percent of un-expected behaviors (1/1,000 cars)	Percent of unexpected behaviors (1/1,000 cars)	Number of running cars	Percent of unexpected behaviors (1/1,000 cars)
Location 1	30	215	139.5	17	411	41.4
Gushiken West	23	180	127.8	6	297	20.2
Location 2	17	202	84.2	1	311	3.2
Oohama	26	381	68.2	19	874	21.7
Location 3	8	118	67.8	24	1,357	17.7
Location 4	11	163	67.5			
Location 5	11	165	66.7			
Location 6	12	200	60.0			
Location 7	9	208	43.3			
Location 8	8	188	42.6			
Location 9	15	366	41.0			
Sesoko Bridge	15	374	40.1			
...



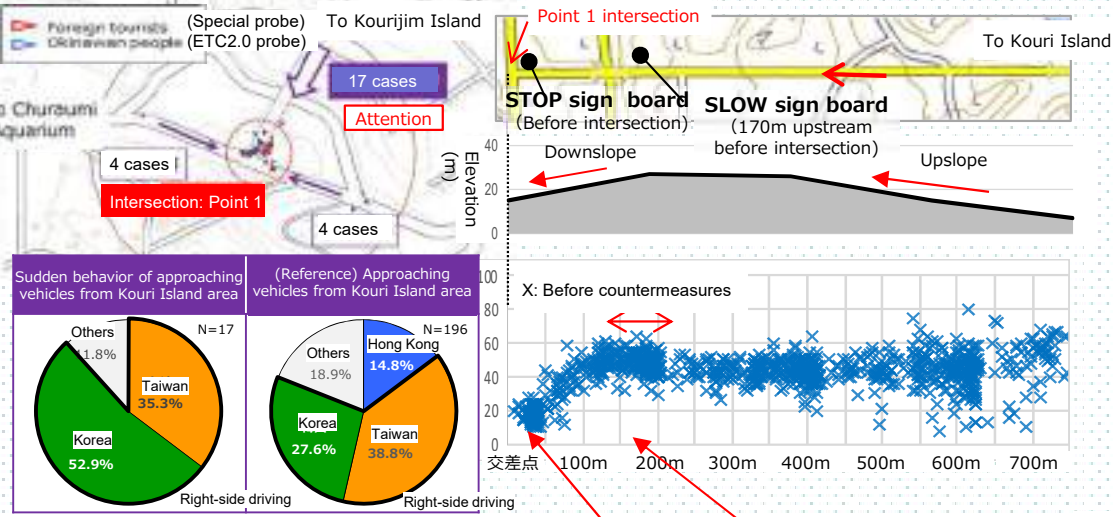
※ Stop-off point: Cars park for half an hour more or more. ※Red: Motobu peninsula (3 municipalities)

Location 1: Warning signboards are installed to encourage speed control in front of the intersection and to reduce the speed of entry to the intersection. In addition, the foreign rental car of the right side traffic (Taiwan and South Korea) is taken into account, thus these boards **are installed on the right side of the road**.

Gushiken West: In order to control drivers' sudden and unexerted behaviors, **English signboards with pictograms** are installed to lead them safely to Churaumi Aquarium.

Intersection: Point 1

- The speed of vehicles entering the intersection from Kouri Island is high. (Sudden behavior occurrence)
- (Driving conditions before intersection)



(Countermeasures: Installation of warning signs)

STOP sign board (Before intersection) **SLOW sign board** (170m upstream before intersection)

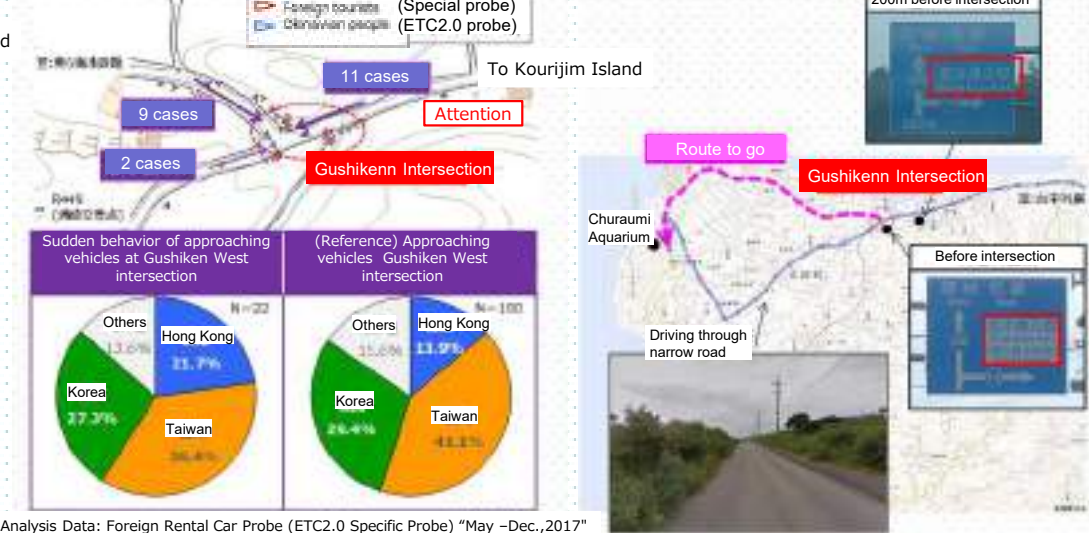
《Possible factors》 In Taiwan and South Korea, signs are installed on the right side of the road due to right-side driving, thus drivers are likely to miss the "STOP " sign on the left side.

《Countermeasures》 A signboard to call attention is installed on the right side. (Sign boards are alternately installed at right and left sides to verify the effect.)



Intersection: Gushiken West

- At a point to make a left turn to Churaumi Aquarium, drivers may lose their ways. (Sudden behavior occurrence)
- (Prowl of a vehicle)



(Countermeasures: to install guide sign boards)

Guide sign board (Before intersection)

《Possible factors》 Guide signs to Churaumi Aquarium are not unified. ※ Sign 300m before intersection: "Ocean Expo Park" and the last sign: "Marine Expo Park (Churaumi Aquarium)"

<Countermeasures> Signboards showing the aquarium in English + pictogram just and 300m before the intersection m.



- There are many opinions that effective methods to call foreign drivers' attention are to add "STOP" to signs, to display "STOP" on roads, and "color pavements."
- It is effective to combine **measures [: recognition] by road surface displays and color pavements that draw intuitive (visual) attention and measures [: understanding] to make the content known to people** by adding English notations so as not to be influenced by nationality .

Effective improvements

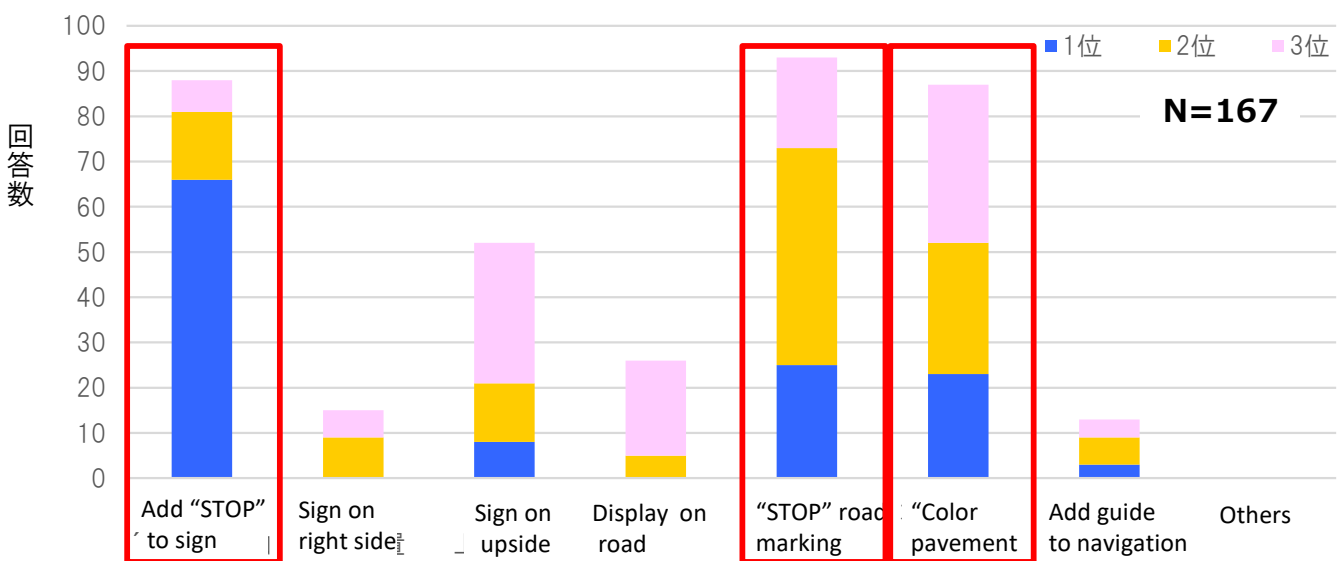


Image of direction (proposal) of improvement



※ Adjusted by Okinawa Prefecture and Okinawa Prefectural Police

	標識に "STOP" 追加	標識の 右側設置	標識の 上側設置	路面に 強調表示	"STOP" 路面標示	カラー舗装	カーナビに 案内追加	その他
1位 (:3点)	198	0	24	0	75	69	9	0
2位 (:2点)	30	18	26	10	96	58	12	0
3位 (:1点)	7	6	31	21	20	35	4	0
合計点数	235	24	81	31	191	162	25	0

分析データ：(美ら海水族館)外国人レンタカー利用者聞き取り調査 H30.9.11-12

Improvement plan in social experiment

- Plan 1: Color pavement + "STOP" road marking
- Plan 2: Improvement of visibility (recognition) by changing from signboard to simple LED board
- Plan 3: To slow speed before intersection (downslope) by expansion of SLOW signs

- There are many opinions that "pictosign addition", "English display expansion", and "directions in names of tourist facilities" are effective.
- It is said that due to low usage rate of information signs in South Korean, "Add auxiliary signs" is effective next to "Add Pictosigns".
- Add pictographic signs and expand English displays to enhance the utilization effect of guide signs by improving their clarity. Draw attention from the people whose use rates of guide signs are low by adding auxiliary signs in places where there are a lot of stray vehicles.

Effective improvements

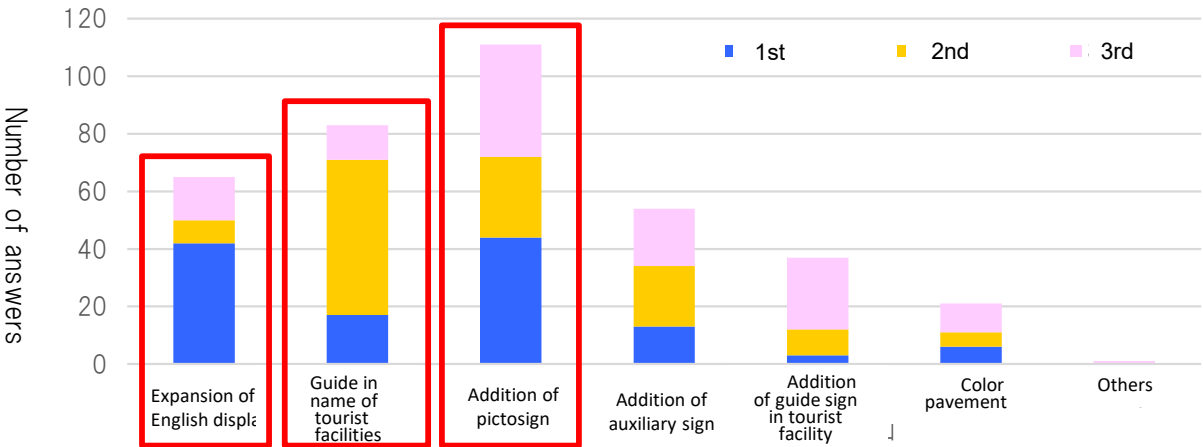


Image of direction (proposal) of improvement

(Improvement of clarity of guide signs)



※沖縄県ブロック道路標識適正化委員会で検討中

(Further warning in places where there is a lot of lost traffic)



	英語表示 拡大	観光施設名 での道案内	ピクトサイン 追加	補助標識 追加	観光施設の 案内標識追加	カラー舗装	その他
All							
1位(3点)	126	51	132	39	9	18	0
2位(2点)	16	108	56	42	18	10	0
3位(1点)	15	12	39	20	25	10	1
合計点数	157	171	227	101	52	38	1
Korea							
1位(3点)	15	0	48	27	0	9	0
2位(2点)	0	20	20	18	8	0	0
3位(1点)	3	3	6	6	8	3	1
合計点数	18	23	74	51	16	12	1

5. Road development initiatives in Okinawa

- (1) Measures to traffic congestion
- (2) Foreign rental car measures
- (3) Okinawa-ART

Considering the introduction of a next-generation urban transport system to Okinawa

- In order to eliminate the problem of road congestion in Naha, the weak public transport system must be revitalized.
- At the same time, field operation tests of self-driving buses are under way, mainly under the SIP* and an initiative that represents a model case of the regional deployment of a next-generation urban transport system is under way in Okinawa.
- In the first half of 2017, a planning meeting to discuss the Okinawa next-generation urban transport system (Okinawa-ART)(provisional name) was convened and an investigation into the installation of self-driving technology and other matters began. *SIP: Strategic Innovation Promotion Program.

Next-generation urban transport system ART (Advanced Rapid Transit)

This is an initiative that adds self-driving and other technologies to BRT to assist drivers in driving better with the aim of ensuring constantly safe, accurate and comfortable service. It also aims to make traffic flow more smoothly and make it easier for wheelchair users to board and disembark by adjusting spaces and heights as necessary.

BRT(Bus Rapid Transit)

Makes it possible to maintain speed and punctuality and increase carrying capacity. A bus system with more advanced functions.

[Upgrade vehicles and facilities]

- Increase convenience and comfort by upgrading vehicles and facilities.
- Connected no-step buses (high capacity, barrier-free, comfortable)
- Upgrade bus stops (to increase comfort during bad weather, simplify boarding and disembarking)

- Bus location system (eliminate irritation while waiting for buses), etc.

[Service optimization]

- Optimize service to create the ideal transport network.
- Express service
- Reorganization of bus routes (major lines, branch lines)

[Ensure speed and punctuality]

- Improve running environment in order to ensure speed and punctuality.
- Dedicated driving lanes
- Dedicated lanes, priority lanes (paint bus lanes a certain color)
- Signal control using PTPS, etc.

Reference: Planning meeting concerning the introduction and promotion of BRT (Ministry of Land, Infrastructure, Transport and Tourism, October 2013)

Image of the Okinawa next-generation urban transport system (Okinawa-ART)

Reduce boarding and disembarking times, improve safety during transfers.

- Switch to non-step buses
- Self-running (accurate parking) technology*
- IC card (OKICA)

Improve speed and regularity of service.

- Major buses
- Bus-only, bus-priority lanes
- Strengthen PTPS*
- Seamless connections between Major↔Branch buses, the monorail, etc.

Service optimization

- Reorganization of bus network (major, branch)

Improve safety and comfort

- Advanced driving support*
- Support and management for wheelchairs when embarking.*
- Optimized acceleration controls, collision avoidance controls *

Universalization of meeting spaces

- High-grade bus stops.
- Transmission of information (service information)

Total design

- Introduce PR-friendly advanced technology
- Consistent design message.
- System design integrated with urban development

Tourist support

- Multilingual service
- Transmitting tourism information
- National IC support



*self-driving bus technology-related

Okinawa next-generation urban transport system (Okinawa-ART)

- Introduce ART as a highly convenient regional symbol in order to free ourselves from excessive dependence on cars.

Goal 1 : Aim high-standard service better than that provided by the use of cars. (Punctuality and constant speed)

- Aim high-standard service better than that provided by the use of cars.
 - ✓ Keep constant speed at 20km/h (currently) and 30km/h (ideally) during peak hours (work, school or home).

Goal 2 : Realize secure, safe and pleasant urban transport environment. (Safety and pleasantness)

- Realize secure, safe and pleasant urban transport environment.
 - ✓ Zero the number of fall accidents that happen inside.
 - ✓ Make it easy for passengers to get on and off.

Goal 3 : Create the environment wherein we can make best use of buses easily. (Convenience)

- Create the environment wherein we can make best use of buses easily.
 - ✓ Effective and suitable frequency: 10 – 12 minute interval run service
 - ✓ Make the environment around bus stops more comfortable.
 - ✓ Make it easy for passengers to pay bus fare.
 - ✓ Make the inside environment more comfortable.
 - ✓ Establish bases for connection.

Goal 4 : Prepare the public transportation to make it a regional symbol. (Symbolic value)

- Aim the public transportation to make it a regional symbol.
 - ✓ Make line numbers, coloring etc. more understandable.
 - ✓ Make waiting rooms more comfortable with high symbolic values.

Goal 1 : Aim high-standard service better than that provided by the use of cars. (Punctuality and constant speed)

- Extend the zones of bus lanes (road improvement, bus lane pavement, regulatory signage installation, resident street measures).
- Improve bottleneck intersections.
- Extend PTPS (Public Transportation Priority System)
- Construct longer bus bays.
- Promote the system to get on a bus from the middle side and to get off a bus from the front side.
- Consider the running space for the use of bus.

Goal 2 : Realize secure, safe and pleasant urban transport environment. (Safety and pleasantness)

- Use self-driving technology for buses to operate right moves at bus stops.
- Use self-driving technology to reduce fall accidents in buses.

Goal 3 : Create the environment wherein we can make best use of buses easily. (Convenience)

- Secure frequencies for suitable run.
- Improve bus stops to grade them up (guide signs for run, preventive measures against heat, methods for maintenance management, etc.)
- Display time schedules of bus arrivals at bus stops.
- Spread IC cards and install charging machines more. (※ Related to Goal 1.)
- Provide services in/outside of buses for Wi-Fi, USB ports, etc.
- Improve the accessibility to bus stops.
- Keep bases for connection in good condition.

Goal 4 : Prepare the public transportation to make it a regional symbol. (Symbolic value)

- Make lane numbers, coloring, etc. more understandable.

Okinawa-ART 車両内

AI を用いた遠隔操作・モニタリングによる
監視技術により安全性の向上

制御センター



車内



自動運転技術による
加速制御により
安全性・快適性が向上

Okinawa-ART 車両

自動運転技術を活用した正着
中乗り前降り方式による乗降時間短縮



中乗り前降り方式

自動運転技術による正着

バスの走行性に配慮した
交差点への運用

PTPS によるバス優先走行

路線バス

2 台併走可能なバスハイウェイ
通過し可能な停車幅員の確保

バスレーン拡張による
バス走行空間の確保

デジタルディスプレイ、広告

USB ポート、Wi-Fi
コンセント等

Okinawa-ART バス停

ハイクレイドバス停による快適な待合空間の創出

サイクル & バスライド

パーク & バスライド

沿線への道路交通の侵入
速度の抑制 (ハンパ等)

ミスト

IC カードチャージ機

遮熱性舗装

ハイクレイドバス停の整備

- Expand bus bays as an approach to reduce the congestion at bus stops.
- Expand bus bays at major bus stops for the introduction of flagship buses scheduled to be implemented in 2021.

Current status

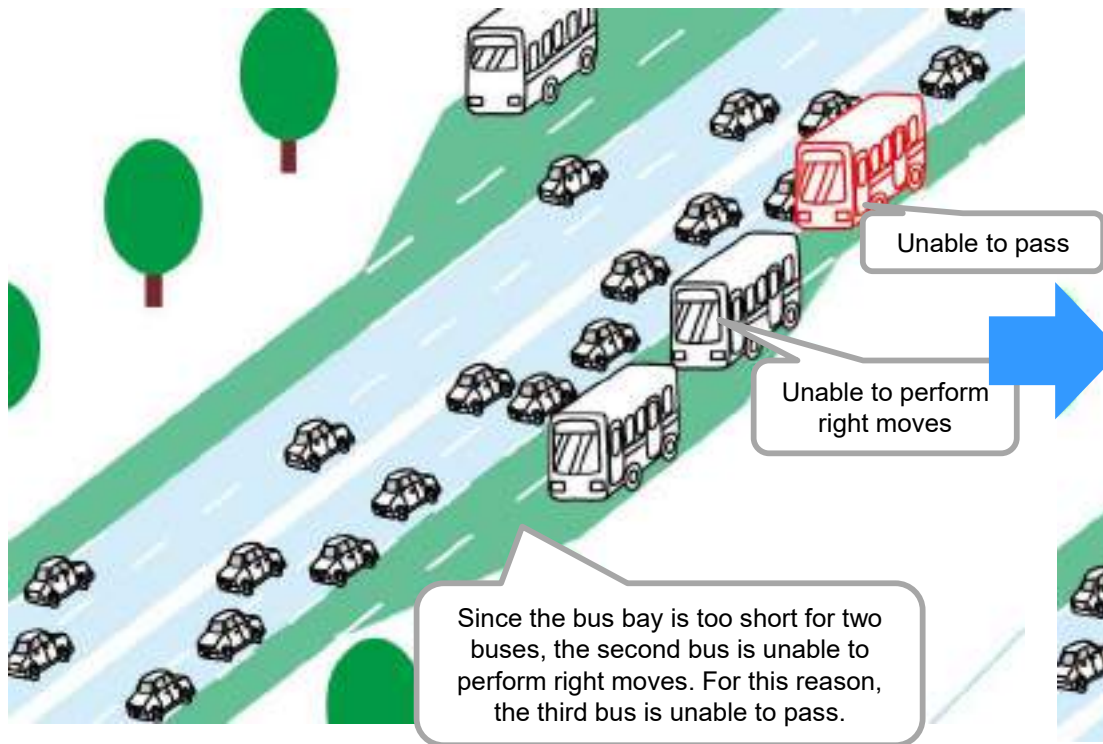
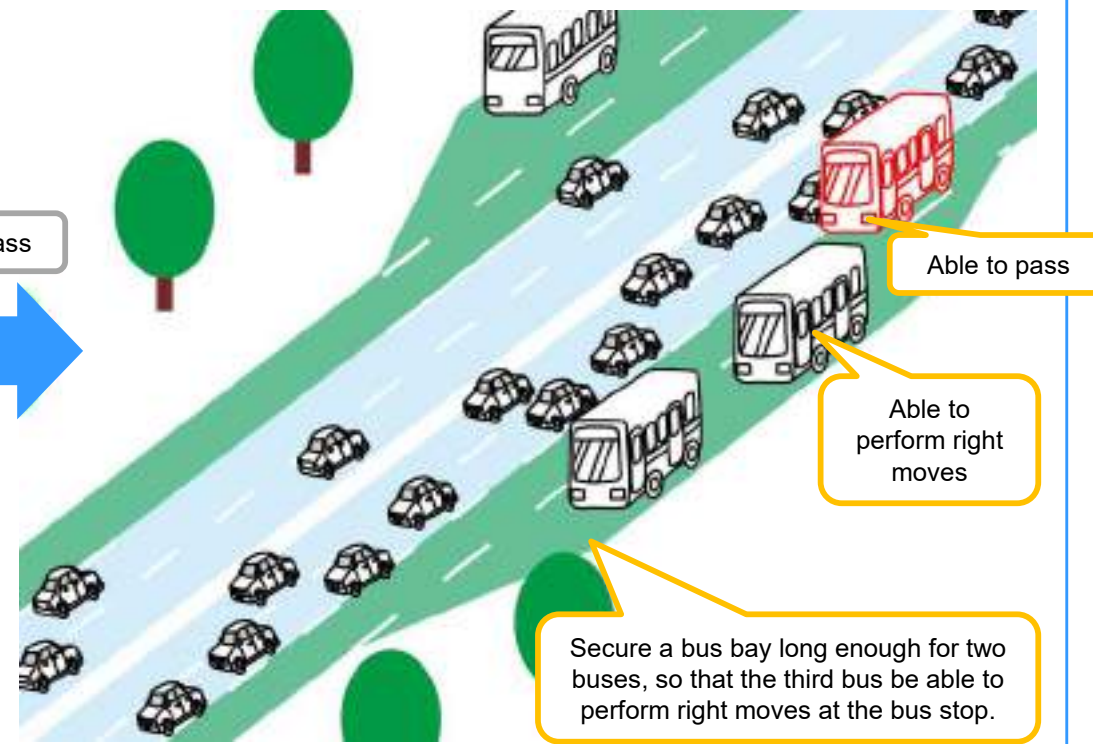


Image of maintenance



Implementation of project

- In fiscal 2020, a couple of bus stops with longer bus bays along major bus routes will be secured.
- New bus bays along major bus routes shall be long enough for operation of right moves.
- Regarding bus stops located in existing zones, the extension shall be carried out as much as possible.

- Consider maintenance of the hardware of high-performance bus stops (long bay, shop, etc.) and software (signage, etc.)

 - The bus bay assumes two simultaneous stops (bus length 12m and 9m).
 - Two target locations: The Norinchukin (bound for Koza) and Higaibaru (bound for Naha) around Rycom.

Target location diagram

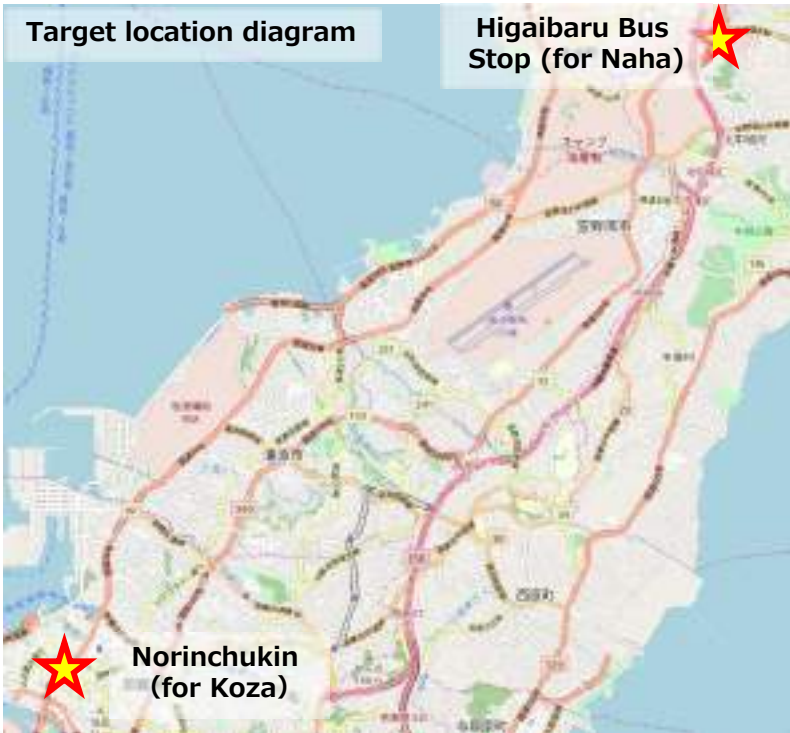
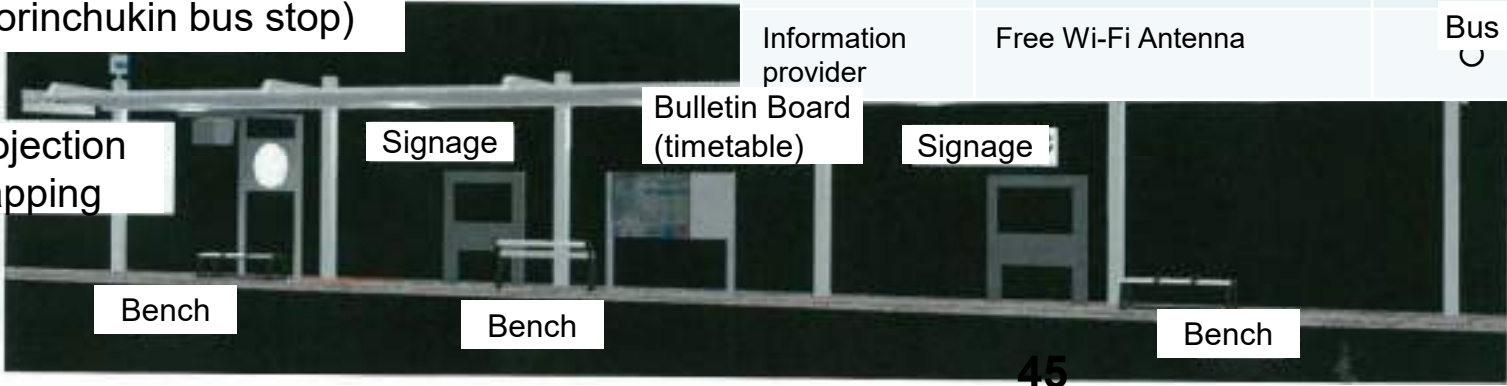


Image of entire bus stop (Norinchukin bus stop)



Item	Contents of maintenance	Norinchukin	Higa Nishihara	Remarks
Bus stop, shop, base	Bus bay and bus stop shop corresponding to two simultaneous stops	Length : 25m Width : 2.0m Hight : 3.5m	Length : 20m Width : 2.0m Hight : 2.5m	Plus 1m of building limits from installing projection mapping in front of Norinchukin
Cooling function	Mist Shower (Operated at 30° C temperature and 70% humidity)		○	Since it is possible to reduce the temperature of a wide range, Higa Nishihara was adopted. There is no structure to block sunlight around.
	Thermal barrier pavement, ILB	○ (ILB)		The surface temperature is reduced by about 10 degree compared to the asphalt paved road surface during the summer.
Guidance display, Information providing equipment	Projection mapping →Display information such as timetable and bus location information on wall	○ (1 screen)		Since the building sits next to the building in front of Norinchukin, which has the shade in the afternoon, thus the brightness is comparatively low, and it can be seen by using a projector with high brightness; low cost compared to signage.
	Signage (screen type) →Information on timetables, bus location information, etc.	○ (2 screes)	○ (1 screen)	Signage is assumed to be visible even in bright places if it is a product with high brightness of 2000 lumens or more.
Information provider	Free Wi-Fi Antenna	Bus stop sign ○	○	Be.Okinawa

Projection mapping

Signage


Bulletin Board (timetable)

Signage

Bench

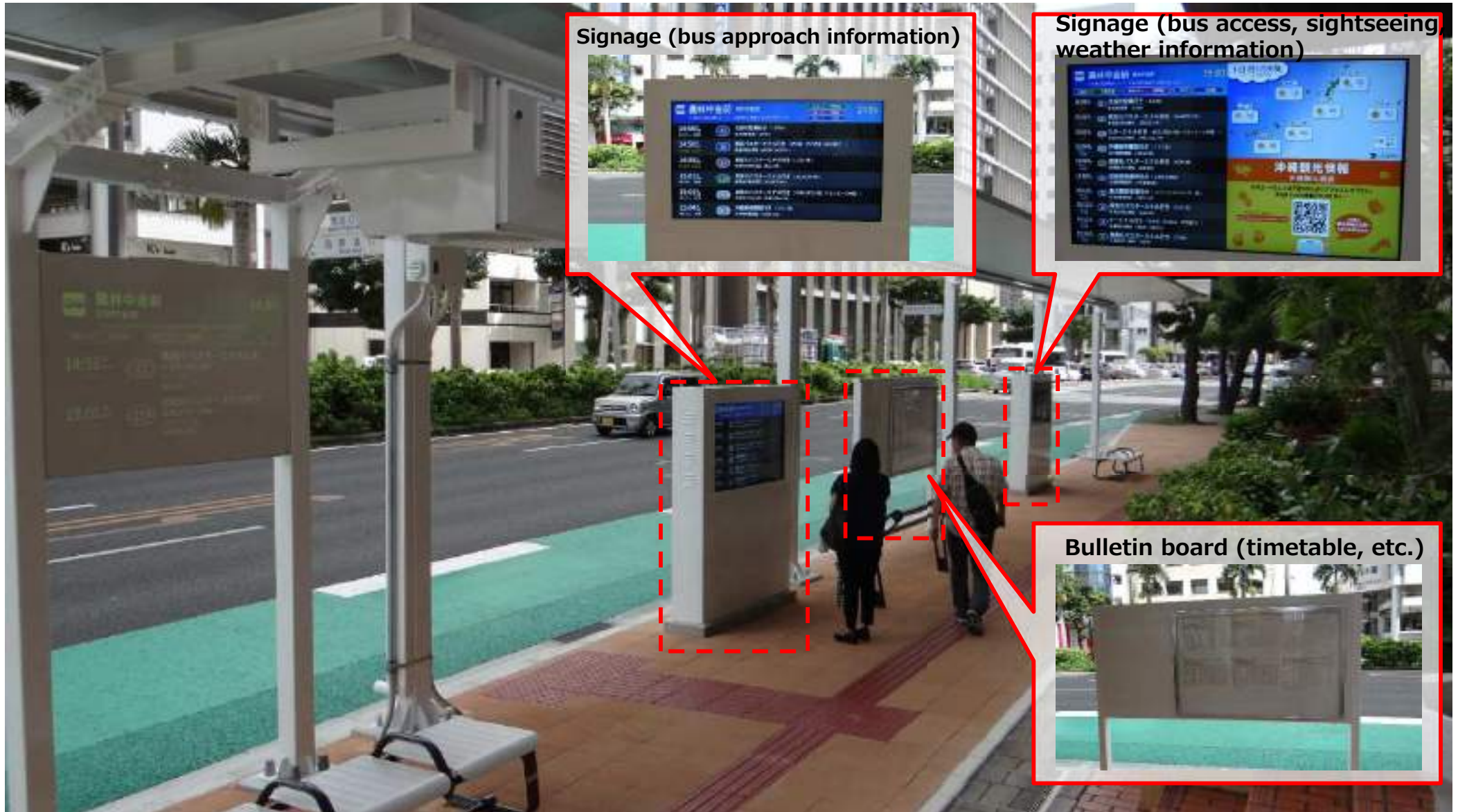
Bench

Bench



○ Implementation of services by next-generation (high-performance) bus stops in main bus route

Norinchukin Bus Stop (bound for Koza)



○ Implementation of services by next-generation (high-performance) bus stops in main bus route

Higaibaru Bus Stop (bound for Naha)



- In Okinawa Prefecture, experiments were conducted in Nanjo City in March, 2017 and Ishigaki City in July, and demonstration experiments were conducted on public roads with relatively heavy traffic in Okinawa Main Island (Kitanakagusku-son and Ginowan City).
- In February 31, 2019 demonstration experiments were conducted on public roads with heavy traffic by large-scale buses, which were the first in Japan.

◆ Nanjo City Demonstration Experiment (March – April, 2017)

- Automated driving on public roads for the first time in Japan -

- Accuracy of regular arrival control and verification of lane maintenance control
- Verification the system by collecting driving status data, monitoring, operation management, etc.



◆ Demonstration experiment in Ishigaki City (June – July, 2017)

-The longest automated driving distance on public roads in Japan-

- Accuracy of regular arrival control and verification of lane maintenance control
- Verification of obstacle avoidance by automatic lane changes
- Verification of speed suppression control using signal information, etc.



◆ Demonstration experiment in Okinawa Main Island (Nov. 1, - Dec.13, 2017)

- Experiments on busy public roads -

- Verification of lane-driving control performance using quasi-zenith satellite
- Verification of driving control using high-precision three-dimensional map
- Verification of regular arrival control performance using magnetic markers
- Verification of the feasibility of AI technology to improve control and sensing technologies
- By utilizing acceleration and deceleration control, reduction of fall accident in the car, verification of improvement of comfortableness of driving, etc.



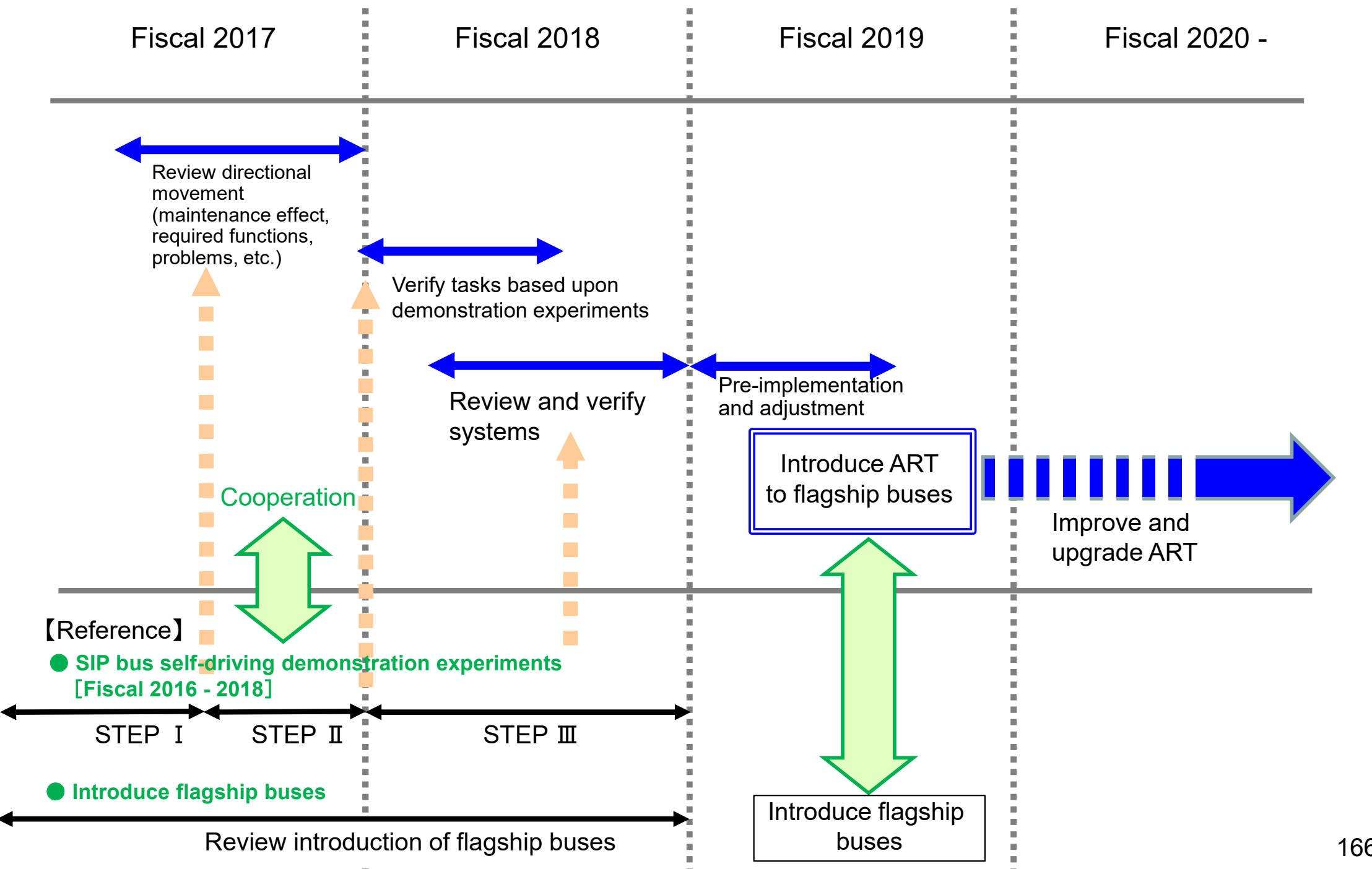
◆ Demonstration experiments from Naha Airport to Toyosaki (Feb. – March, 2019)

- Experiments on public roads by large-scale bus for the first time in Japan-

- Verification of stability and reliability of advanced arrival control and of optimal acceleration/ deceleration control under a variety of conditions.
- Verification of lane maintenance and deceleration control at legal speed limit (50km/h)
- Verification of lane maintenance and deceleration control at legal speed limit (50km/h)
- Evaluation of demand by questionnaire survey by general users and crew members



Schedule (Proposal)



Thank you very much for your attention.