

# Development of networks and bases to facilitate human movement and logistics

## - Connecting people and regions -

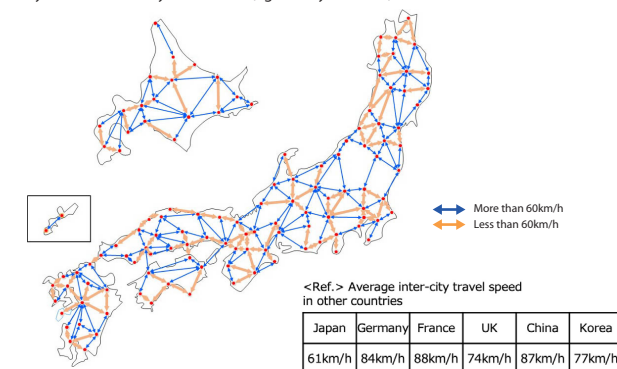
In order to create a seamless, hub-connected nation with stable logistics, it is necessary to construct a national trunk road network that ensures fast delivery and accessibility. While working on the development and functional enhancement of high-standard roads, we will promote efforts to strengthen modal connectivity, counter congestion, and support logistics through the development of transportation hubs.

### Express services between cities

Japan is still lagging behind other countries in terms of inter-city speed, with about 40% intercity (101/235 links) still less than 60 km/h.

#### ■ Status of inter-city travel speed

Calculation method of intercity transit speed: 122 cities, 235 links. Calculated using the average of ETC2.0 data for 12 hours during the daytime on weekdays in FY2021 (light-duty vehicles).



※ This map is not an exhaustive list of national territories.

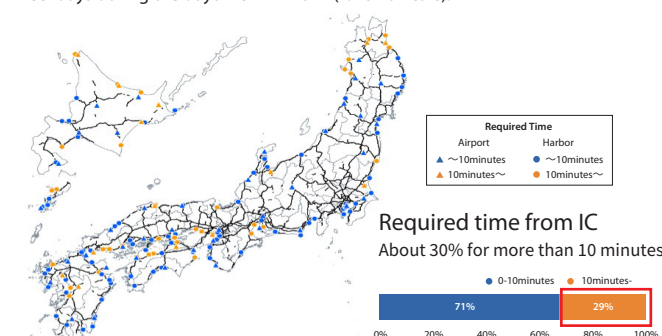
### Accessibility to airports and harbors

Airports and ports are hubs for wide-area movement of people and logistics, but about 30% of locations (50/170 locations) require more than 10 minutes to reach from a high-standard road.

#### ■ Accessibility to major airports and ports

\* Major airports and ports: hub airports and jetting airports, international strategic ports, international hub ports, and important ports

\* Travel times are calculated using the 12-hour average of ETC2.0 data for weekdays during the daytime in FY2021 (for small cars).



### Looming logistics crisis

The logistics industry faces the "Logistics 2024 Problem," in which it is feared that logistics will stagnate due to insufficient transportation capacity if no measures are taken to address labor shortages and the need to become carbon neutral, due to working time regulations.

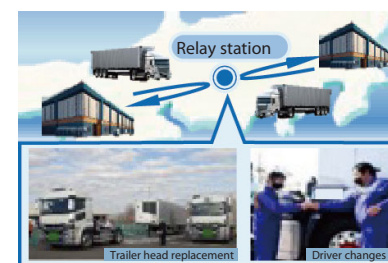
#### ■ Impact on logistics due to working time regulations in the motor vehicle transportation business



### Development of base functions

Strengthening of logistics facilitation, space creation focusing on people, coordination among mobilities, and disaster prevention functions.

#### ■ Image of relay transportation



#### ■ Image of Busta Yokkaichi facilities



## Development and functional enhancement of road network

### - Construction of seamless network -

To build a seamless, high-standard road network, we will promote efficient development, focusing on strengthening road networks that shorten transit times between major cities, ring roads in three major metropolitan areas and ring roads in regional cities that realize fast and smooth logistics, and access roads to major ports, airports, and high-speed rail stations.

### Development based on the National Spatial Development Plan

Based on the National Spatial Strategy(Ref. 1), we aim to form and functionally improve, while also utilizing the existing network, a high-standard road network of over approximately 20,000 km with a seamless level of service that combines 14,000 km of high-standard arterial roads and a wide-area road network that complements these roads and strengthens exchange and coordination within and between wide-area regions.

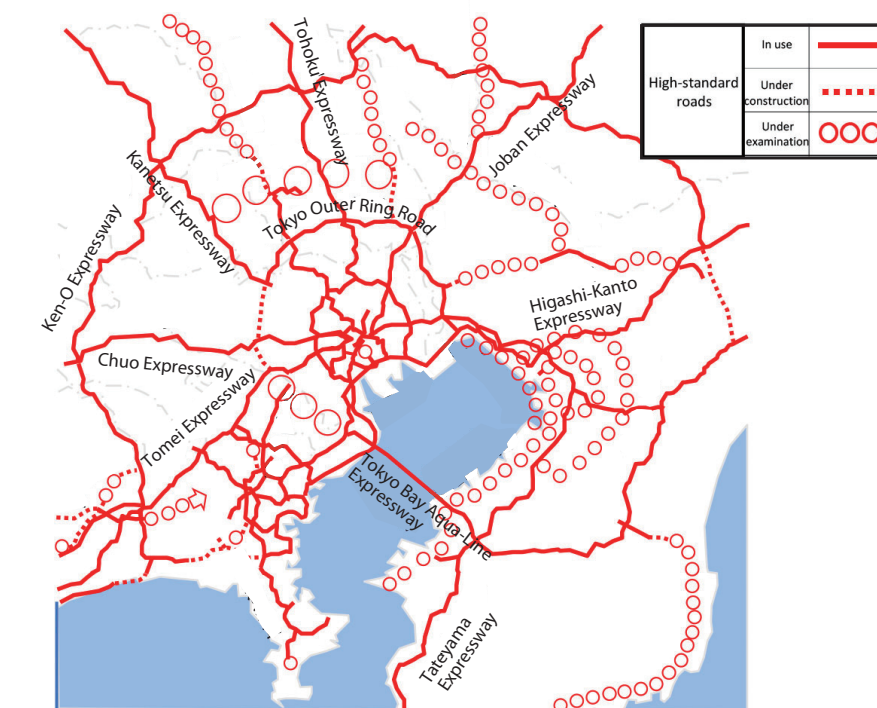
Based on the "New Regional Road Transportation Plans"(Ref. 2) formulated in each region, promote functional enhancement by systematically surveying and improving road networks while utilizing individual subsidy programs for important logistics roads.

- Rate of inter-city express delivery by road (2019→2025) : 57%⇒63%
- Development rate of the ring roads in the three major cities (2020→2025) : 83%⇒89%

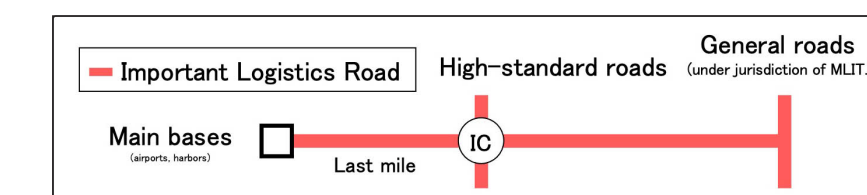
Expanding the sections on Important Logistics Roads where special vehicle permits are not required for international marine container trucks (40ft long) (Ref.3).

Conduct research on methods to understand and evaluate various effects of road maintenance based on changes in mobility.

#### ■ High-standard roads in the metropolitan area (New wide-area road transportation plan)



#### ■ Image of Important Logistics Road



Ref. 1: National Spatial Strategy (National Plan) (cabinet resolution made on July 28, 2023)  
 Ref. 2: The plan consists of a wide area road network plan, a transportation and disaster prevention base plan, and an ICT transportation management plan. Versions for prefectures, ordinance-designated cities, and blocks (formulated by regional development bureaus, etc.) have been formulated by July 2021.  
 Ref. 3: Designated approximately 31,400 km of road sections that do not require permits for international maritime container trucks (40ft long) (as of July 2023)

## Development and functional enhancement of road network

### - Strengthening access to the network from transportation and logistics hubs

To improve accessibility from transportation and logistics hubs to expressways and other networks, we support the development of Smart IC and access roads.

Promote a smart IC system directly connected to private facilities, which allows the private sector to initiate and bear the burden of development.

#### Background / data

- The average interval between expressway interchanges in Japan was about 10 km, about twice as long as that of toll-free expressways in flat areas in Europe and the U.S. Therefore, a smart IC system was established after a social experiment from 2004.

- Number of expressway ICs: 1,521
- For those managed by the Expressway Companies (including projects in progress, excluding smart IC).
- Smart IC: 156 open, 52 under construction.
- Smart Interchange directly connected to private facilities: 2 smart interchanges opened nationwide (Awaji-Kita Smart IC, Taki Vison Smart IC).

All figures are as of the December 31, 2023

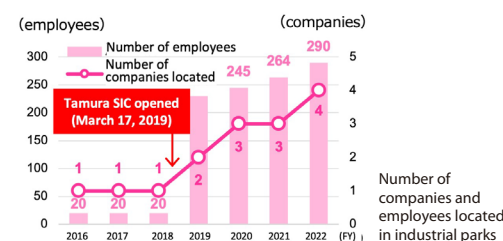
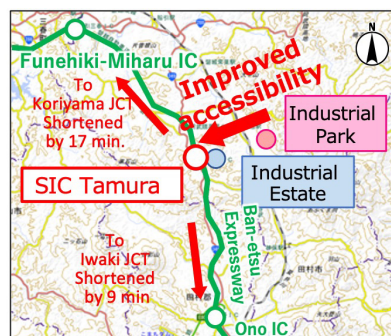
In order to promote more efficient logistics, regional revitalization, and enhanced disaster prevention functions, the need for Smart IC will be examined in the regions, and the development of Smart IC will be promoted. Focused support for the development of access roads in conjunction with the development of interchanges, ports, airports

through individual subsidies.

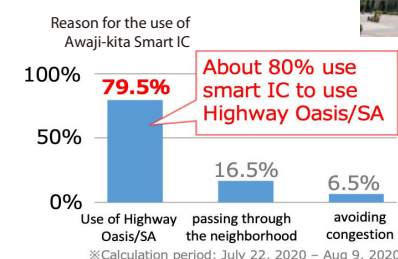
Promote the development of smart IC directly connected to private facilities through interest-free loans to private operators and exemption from registration and license tax.

#### ■ Effects of smart IC development (example of Tamura Smart IC)

- Smart Interchanges will improve accessibility to expressways and surrounding businesses.
- Companies locating in the vicinity, creating approximately 300 new jobs.



#### ■ Construction of an IC with direct connection to the private sector (Awaji Kita Smart IC)



## Strengthening the modal connect and promoting the support for public transportation

We will promote the Busta project to enhance connections between various modes of transportation (modal connect) and create new road spaces.

We promote the introduction of public transportation systems, such as BRT, that contribute to reducing environmental burden and revitalizing local communities.

### Busta project business development and deepening of initiatives

#### Background / data

- Guidelines(Ref.1) were compiled as a reference for planning the functional enhancement of transportation hubs (April 2021).

In addition to Shinjuku Expressway Bus Terminal, which is currently in service, Busta projects are being promoted at seven other locations in Japan, including Shinagawa Station West Exit and Kobe Sannomiya Station, utilizing various methods such as concessions.

Promoting the development of transportation hubs of various sizes and types, such as accommodating new mobility such as automated vehicles and community buses.

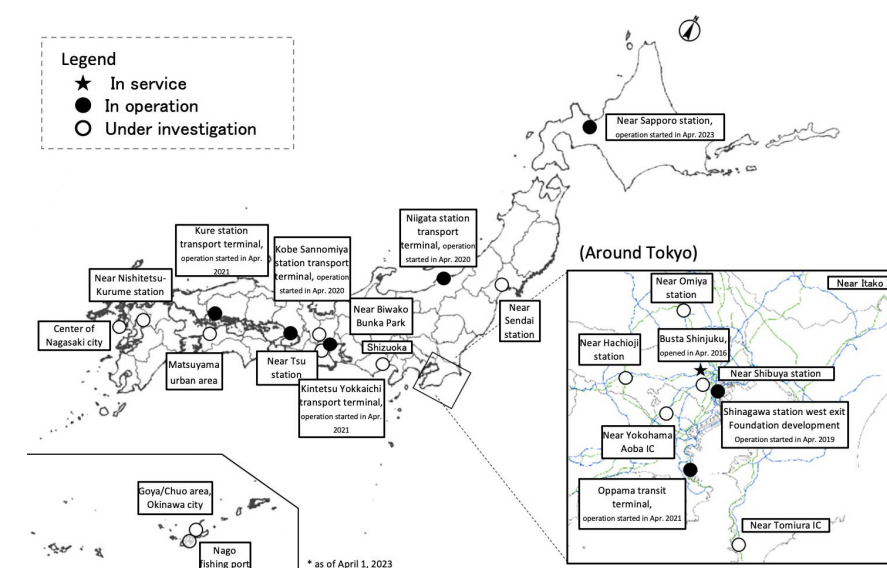
### Promote the introduction of public transportation systems such as BRT

#### Background / data

- Established guidelines(Ref. 2) for local governments summarizing the BRT study process, support menu, case studies, and points to keep in mind (September 2022).

Support for improving the driving environment for local public transportation systems as specified in the local government's community development plans.

#### ■ Major areas of study and progress in the Busta Project



#### ■ Image of enhanced traffic nodal function

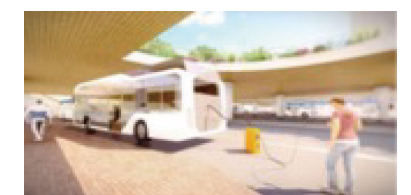


Image of the terminal (Kure Station) consolidating intercity buses and route buses, and accommodating electric vehicles (EVs) and other vehicles

#### ■ Example of BRT



Articulated bus (Gifu City)

Ref. 1: Planning Guidelines for the Functional Enhancement of Transportation Hubs (Road Bureau, Ministry of Land, Infrastructure, Transport and Tourism)  
Ref. 2: Guidelines for the introduction of regional public transportation (BRT), utilizing road space (Policy Bureau, City Bureau and Road Bureau, Ministry of Land, Infrastructure, Transport and Tourism)



## Development of performance managements

To improve productivity and contribute to carbon neutrality, we will promote efforts to improve the performance of the road network (performance management) according to the required level of service.

### Background / data

- Poor performance due to uneven traffic volume, frequent traffic congestion, and other problems with the uneven road network.

Actual average speed(Ref. 1) (36 km/h) is about 60% of free flow speed(Ref. 2) (61 km/h) (as of FY2021)

## Observation and evaluation of service level

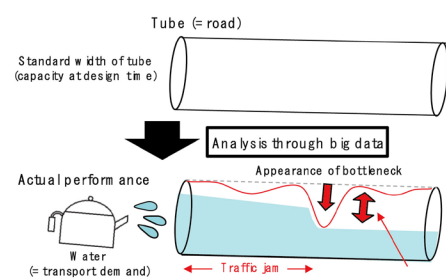
Evaluate service levels with data and promote the acquisition of data and development of standards necessary to implement efficient and effective measures.

Promote efforts to study service level observation and evaluation methods and improve performance by utilizing the Regional Road

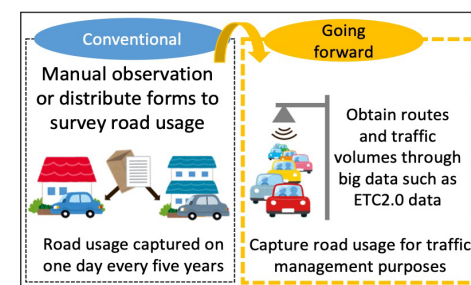
Economy Strategy Study Group(Ref. 3).

By utilizing big data such as ETC2.0, review the conventional national survey on road and street traffic conditions to establish a new road traffic survey system.

### ■ Conceptual diagram of road performance



### ■ New road traffic survey system



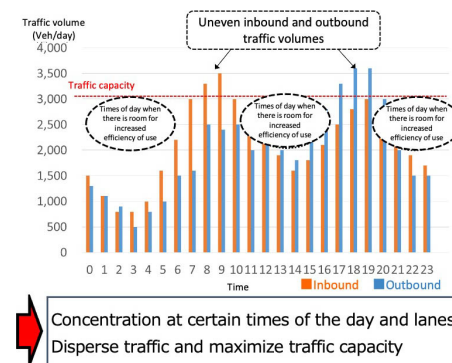
## Efforts to improve performance

Promote new measures such as localized and area-based congestion countermeasures according to the required level of service, 2+1 lanes(Ref. 4), and roundabouts(Ref. 5).

Promote cooperation with the demand side, such as collaboration with local communities and TDM including variable pricing, in order to make more effective use of the potential of existing infrastructure.

Promptly implement disaster transportation management(Ref. 6) after a disaster to ensure performance even in an emergency situation.

### ■ Image of effective use of traffic capacity



### ■ Examples of new measures



2+1 lanes (E39 in Norway)



Roundabout (Stavanger, Norway)

Ref. 1: Average travel speed (calculated from ETC2.0 for expressways, general national highways, major regional roads and prefectural roads)  
Ref. 2: Top 10% tile speed (calculation conditions are the same as above)  
Ref. 3: Based on expert opinions, strategies for regional economic revitalization utilizing road space and social experiments and implementation conducting research  
Ref. 4: A method to expand traffic capacity by installing an additional lane on an existing two-lane road  
Ref. 5: Consider introduction at intersections where traffic capacity is expected to increase due to improvements of traffic facilitation through reduction of waiting time at traffic signals and processing capacity at multi-branch intersections with five or more branches  
Ref.6: Implemented through the Disaster Traffic Management Study Group comprised of the Ministry of Land, Infrastructure, Transport and Tourism, police, local governments, expressway companies, academics, related organizations, and business operators.

## Efficient and effective traffic congestion control

To address issues such as reduced productivity and increased CO2 emissions due to traffic congestion, we will promote efficient and effective software and hardware measures tailored to the current situation and factors underlying traffic congestion, while strengthening cooperation with local governments and other entities.

### Background / data

- Approximately 9,000 major congestion identified by the national traffic congestion countermeasures council. (as of September 2023)
- Annual congestion loss is equivalent to approx. 40% of the time spent driving/riding. (as of 2021)

Utilize big data to implement efficient and effective local congestion countermeasures and soft measures such as TDM to address issues that are unevenly distributed over time and space.

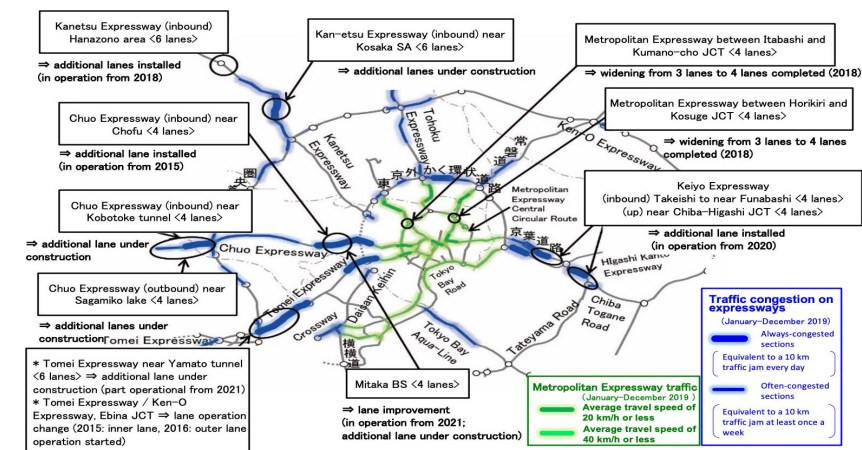
Strengthen cooperation with truck and bus user groups at the traffic congestion countermeasures council[Ref.1] to promote quick-response measures and consider more efficient and effective measures based on monitoring results.

In order to ensure smooth traffic on important logistics roads, we

will continue to require road traffic assessments[Ref.2] to be conducted by those who have facilities located along the road.

Based on the knowledge of traffic congestion countermeasures in various parts of Japan, promote traffic congestion countermeasures that contribute to the realization of smooth traffic and transportation during major events such as Osaka and Kansai Expo.

### ■ Examples of data-driven pinpoint congestion countermeasures (1)



Implementation of pinpoint countermeasures using big data on expressways in metropolitan areas (12 locations under project).

### ■ Examples of congestion countermeasures (2)

: Congestion traffic jam countermeasures at the F1 Japan Grand Prix in Suzuka



To deal with the traffic congestion caused by the large number of visitors in a short period of time, implement measures such as restricting traffic on national roads, operating temporary shuttle bus lanes, and providing information on traffic congestion and recommended routes using flyers and digital signage at service areas and convention venues.

## Introduction of toll measures to optimize traffic flow

Based on the interim report of the Committee on National Arterial Road(Ref. 1) , we will promote studies such as the introduction of a new toll system to build a sustainable expressway system.

In order to use expressways more wisely, we will consider the full-scale introduction of tolls based on congestion.

## Review of metropolitan area tolls

### Background / data

[July 2015: Three Wise Principles of Tolls]

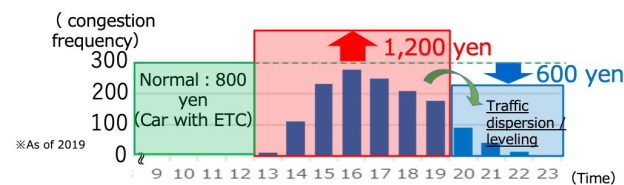
- (1) A fair toll structure based on the level of usage.
- (2) A simple and seamless toll system that transcends management entities.
- (3) A strategic toll system to optimize traffic flow.

Sequential toll rate revisions in the Tokyo, Kinki, and Chukyo regions.

### Tokyo Bay Aqua-Line congestion charge (July 2023)

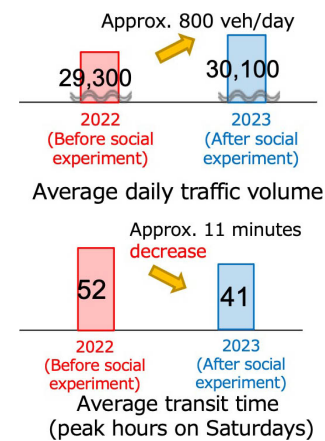
- Conducting social experiment introducing congestion-based time-varying tolls on Tokyo Bay Aqua-Line which is experiencing heavy traffic congestion on weekends and holidays. Time-varying charges will be expanded to ease traffic congestion and equalize tourism demand, and contribute to carbon neutrality, while seeking to build consensus in the local community.

### Traffic congestion frequency on holidays in FY 2019, and experimental toll system



### Average daily traffic and passing time

Preliminary report on data for July 22 – December 3, 2023



## Main initiatives based on the Interim Report

Implement a review of discounts to address the main current issues regarding nationwide toll discounts.

- In order to equalize tourism demand, excluding the application of holiday discounts during peak periods (year-end and New Year, Golden Week, and O-Bon holidays) and the real discount rate for expressway excursion passes on weekdays have been expanded [since 2022].
- In addition, late-night discount will be extended to include only the portion of travel during the discount period, in consideration of vehicle congestion at toll booths. (to be reviewed in FY2024)
- In April 2023, a non-time-specific commuting pass was introduced in Ishikawa Prefecture, with more flexible hours to accommodate diverse work patterns. A nationwide trial will begin in April 2024, with the aim of full-scale deployment by the end of fiscal 2026.

Promote the introduction of toll system that are proportional to the distance traveled in order to relieve chronic traffic congestion on expressways in major metropolitan areas.

## Continuation of measures to expand volume discounts

Continuation of measures to expand volume and frequency discounts for motor carriers using ETC2.0.

(Implemented until March 31, 2025, according to the supplementary budget for fiscal year 2023)

Ref. 1: Published on August 4, 2021

## Logistics support in the road sector

In line with the “Comprehensive Logistics Policy Outline”, we will promote road-related initiatives to realize "simple and smooth logistics," "carrier-friendly logistics," and "strong and flexible logistics."

In order to address the 2024 logistics problem, we will implement measures to improve the working environment for drivers based on the "Policy Package for Logistics Innovation" compiled in June 2023.

## Ensuring truck drivers have reliable rest opportunities

### Background / data

- On expressways, a shortage of parking spaces for large vehicles has become a problem.
- The standard for improvement of working hours for truck drivers requires a rest break every 4 hours of driving.

Secure parking spaces for approximately 30,000 large vehicles nationwide by FY2022 by changing the layout of parking spaces.

### Number of large vehicle parking spaces expanded by the three NEXCO companies

FY2018 - FY2022 provision	FY2023 Provision Plan	FY2024 Provision Plan
approx. 3,000 vehicles	approx. 600 vehicles (planned)	approx. 500 vehicles (planned)

Introduction of short-time limited parking spaces for large vehicles to ensure rest opportunities.



### Promotion of relay transportation

Promote practical application and adoption of relay transportation by conducting demonstration tests and establishing bases

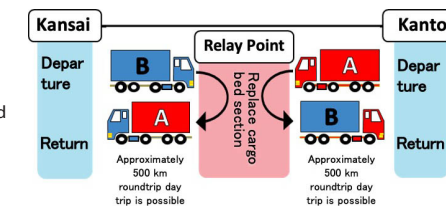


Image of relay transportation



Connected Parking Miyajima operation was launched in FY2023

## Promote the use of double-trailer trucks to save manpower

### Background / data

- 15 operating companies, 333 licensed units (total). (as of September 30, 2023)
- Double-trailer truck priority parking: 269 spaces. (as of September 30, 2023)

Examine route expansion based on operation status and operator needs, and develop parking spaces for double-trailer trucks.

## Other efforts to improve logistics efficiency

Relaxation of traffic time zone conditions for oversized and overweight vehicles in order to achieve the work style reform.

Improve convenience by promoting digitalization of road structure information to shorten the time required for procedures for oversized and overweight vehicles to pass (routes to be prioritized to be digitalized by FY2026).

Continuation of the expansion of large-volume and high-frequency discounts, and promotion of the six-lane expansion of the Shin-To-me and Shin-Meishin Expressways.

Study for the construction of clean-energy automated logistics roads utilizing road space as a new form of logistics where cargo is automatically transported.

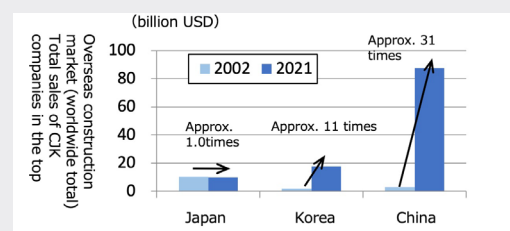


## Export infrastructure systems in the road sector

In order to capture the global demand for infrastructure, we will work together with the public and private sectors to promote the acquisition of overseas road projects based on the “Strategy for Overseas Development of Japanese Infrastructure Systems 2025” (Ref. 1) and the “Strategy for Overseas Development of the Road Sector”(Ref.2).

### Background / data

- Demand for transportation infrastructure (road, rail, ports, airports) in Asia will be US\$520 billion/year (2016-2030). (Ref. 3)
- In the overseas construction market, Chinese and Korean companies have been rapidly increasing their orders in recent years. (Ref. 4)



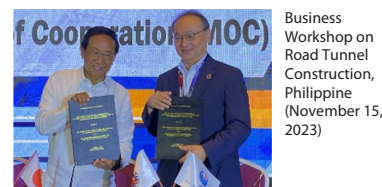
In accordance with the “Act on Promotion of Japanese Companies' Participation in Overseas Social Infrastructure Projects”, we promote the overseas development of Japanese companies together with expressway companies.

We provide support and encouragement to obtain O&M projects(Ref. 5) for tunnels and bridges to be constructed with loans in yen.

## Examples of tendering support

### Memorandum of Understanding for cooperation in the field of tunneling (Philippines)

Further strengthen ties with Japanese expressway companies by sharing O&M technologies and holding workshops on the occasion of the groundbreaking of the first full-scale road tunnel (Davao Bypass) in the Philippines.



## Examples Overseas Development by Expressway Companies

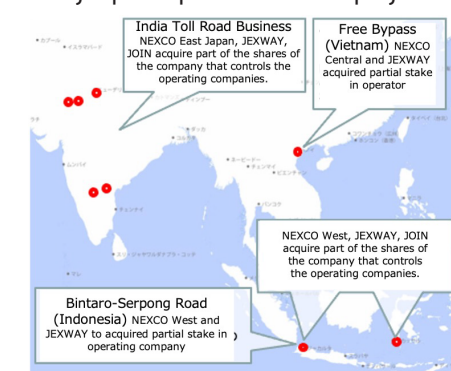
### Non-Destructive Inspection of Structures (US)

NEXCO West Japan established NEXCO-West USA, Inc. to enter the bridge inspection business in the U.S.A. and to investigate advanced technologies. They received orders for non-destructive point infrared camera inspection of concrete slabs using an infrared camera.

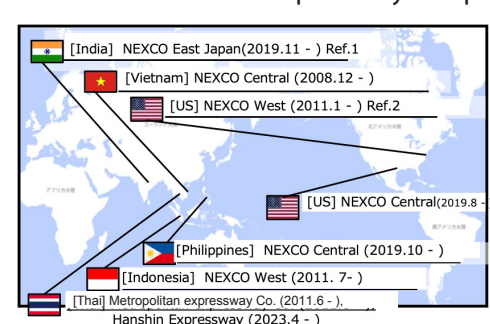
### Established ASIAM Infra, a new road maintenance and management company (Thailand)

Japanese companies including Hanshin Expressway have established ASIAM Infra Company Limited, a joint venture for road maintenance and management, with Thailand's Don Mueang Tollway Public Company Limited. The joint venture plans to expand its business mainly on expressways in Thailand.

### Major participation road PPP projects



### Overseas offices of expressway companies



In addition to the above, group companies Central Nippon Exis Company and Hanshin Technical Laboratory have established subsidiaries in Taiwan and China, respectively

Ref. 1: The Strategy is based on the “Strategy for Overseas Development of Japanese Infrastructure Systems 2025,” which includes the formulation of sector-specific action plans and the creation of multiple layers of action KPIs, plus specific measures added by June 2023 resolution of the Keiyo Infrastructure Strategy Council. Ref. 2: Decided by the Keiyo Infrastructure Strategy Council in February 2019. Ref. 3: Asian Development Bank Meeting Asia's Infrastructure Needs. Ref. 4: ENR's The Top International Contractors (2003,2022) Orders received by top companies in terms of global market share for each year, as calculated by ENR's questionnaire and aggregated by country. Subject companies vary each year. Ref. 5: O&M: Operation & Maintenance

# Realization of a decarbonized society through promotion of Green Transformation (GX)

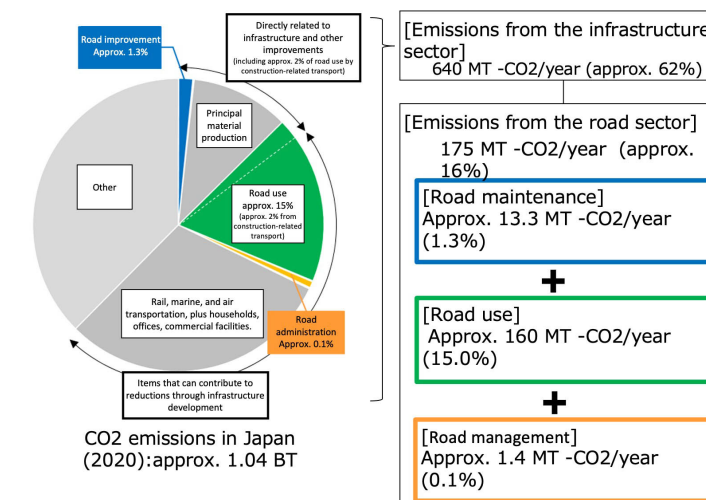
## - Contribute to carbon neutrality by 2050 -

As natural disasters become more severe and frequent due to climate change, global warming countermeasures are an urgent issue, and we will promote decarbonization efforts in the road sector based on the “Strategy for Promoting Carbon Neutrality on Roads” to achieve a carbon neutral and decarbonized society by 2050.

## CO2 emissions in Japan

Approximately two-thirds of Japan's total CO2 emissions are related to the infrastructure sector [Ref. 1]. The road sector emits about 175 million tons (MT) of CO2 per year, accounting for about 16% of total domestic emissions.

In order to achieve the government's goal of achieving the carbon neutrality by 2050, it is necessary to accelerate current efforts and promote further measures, as well as to deepen areas of cooperation with other fields and collaborate with related organizations.

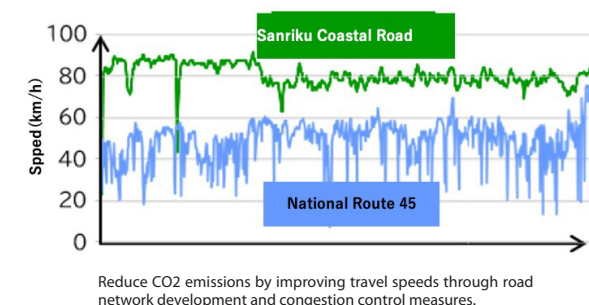


## Strategy to promote carbon neutrality on roads]

### - Interim summary (September 2023) -

In order to achieve the government's goal of a 46% reduction in greenhouse gas emissions by 2030 and carbon neutrality by 2050, we will focus on four pillars of implementation.

### ■ Appropriate road traffic



### ■ Transformation to low-carbon human flow and logistics



Establishment of bicycle lanes

### ■ Green transformation of road traffic



Promote installation of EV charging facilities

### ■ Overall low-carbonization of road lifecycle



Promote introduction of LED lighting