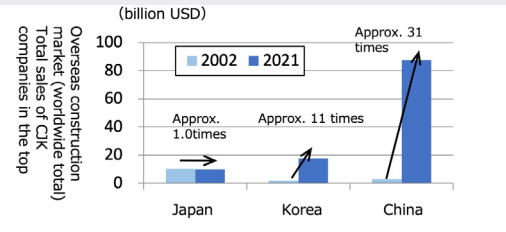


Export infrastructure systems in the road sector

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)



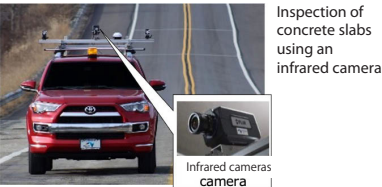
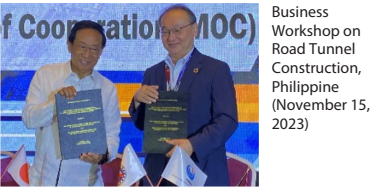
In accordance with the “Act on Promotion of Japanese Companies' Participation in Overseas Social Infrastructure Projects”, we promote the overseas development of Japanese companies together with expressway companies.

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

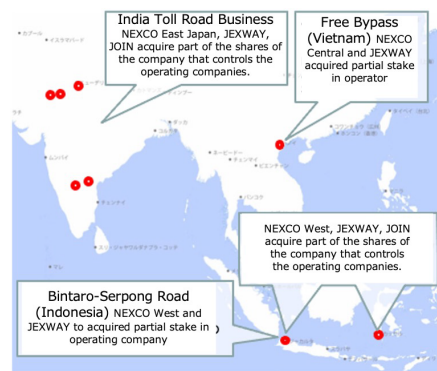
Non-Destructive Inspection of Structures (US)

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.

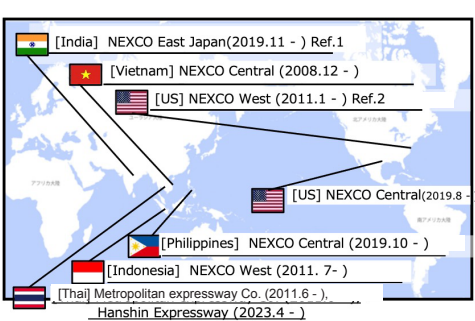
Established ASIAM Infra, a new road maintenance and management company (Thailand)

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)

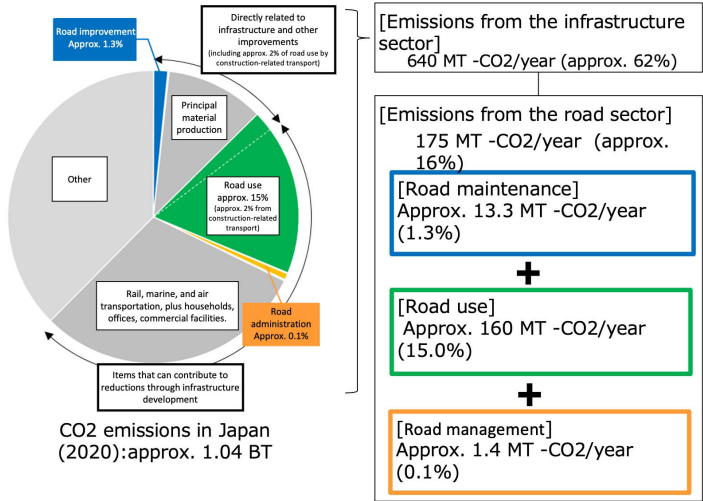
- Contribute to carbon neutrality by 2050 -

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.

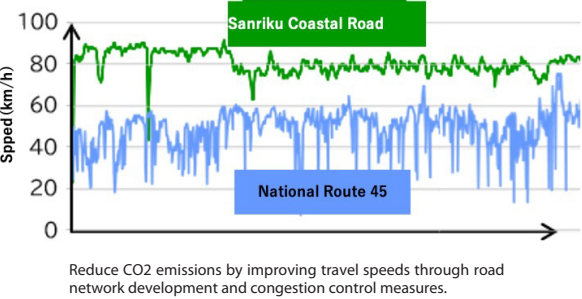
In order to achieve the government's goal of achieving the carbon neutrality by 2050, it is necessary to accelerate current efforts and promote further measures, as well as to deepen areas of cooperation with other fields and collaborate with related organizations.



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



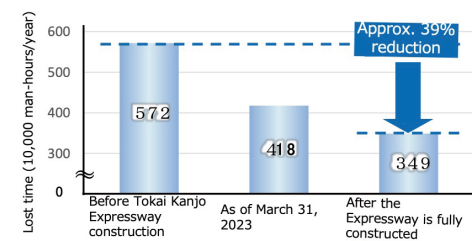
Promote introduction of LED lighting

Optimization of road traffic

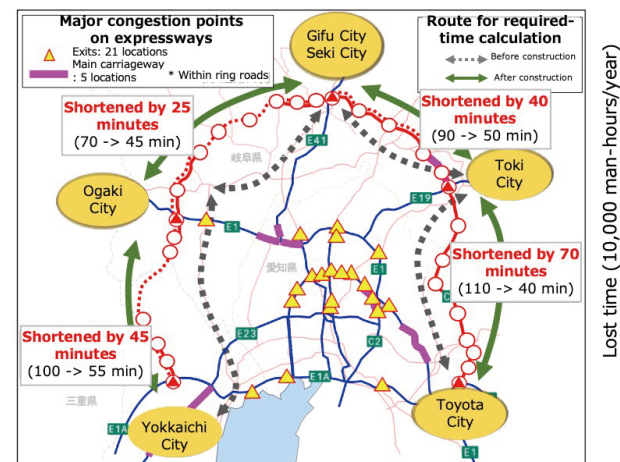
We aim to improve travel speeds by improving road networks and eliminating congestion bottlenecks, as well as to create an environment that allows people to choose the appropriate travel method in accordance with their location through efforts to promote functional differentiation by controlling automobile access to living spaces.

Construction of road network

Improve travel speeds and reduce CO2 emissions by promoting the development of roads that increase productivity, such as ring roads in the three major metropolitan areas and high-standard roads in rural areas, as well as four-lane roads.



Prospect of easing traffic congestion on the inner side of Tokai Kanjo Expressway due to the development of Tokai Kanjo Expressway



Elimination of congestion bottlenecks

Smoothen traffic flow through flexible and area-based traffic congestion countermeasures such as partial improvement of roads and elimination of bottlenecks by detouring around railroad crossings, creating multi-level intersections.



Bottleneck countermeasures (provision of additional lanes)

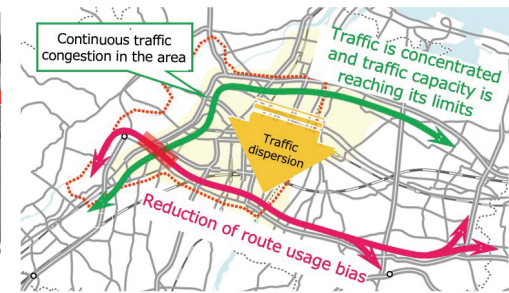


Image of regional congestion countermeasures

Efforts to curb and disperse automobile use

Promote society-wide efforts to effectively utilize traffic capacity by diversifying demand through transportation demand management (TDM), including toll measures.



Promote appropriate functional differentiation of roads in the living space by promoting the provision of arterial roads as necessary in conjunction with traffic safety measures such as "Zone 30 Plus" and other wide range of speed control, entry control, and speed reduction measures.



Realization of automatic operation

Promote efforts to realize and expand automated driving through road-vehicle coordination such as intersection sensors.

Shift to low-carbon human flow and logistics

Promote low-carbon transportation through the use of public transport, bicycles and creating people-first road space, and promote low-carbon logistics by improving transportation volume and logistics efficiency.

People flow: low-carbon road transportation

Promote the development of spaces for bicycles and e-scooters that are appropriately separated from pedestrians and motor vehicles.

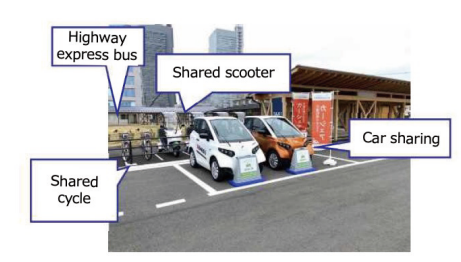
Establishment of bicycle lanes



Promote the spread of cycle trains, cycle buses, shared cycles, car sharing, and other forms of public.

Support the introduction of public transportation systems such as Bus Rapid Transit (BRT), and promote the development of transportation hubs such as bus terminal and mobility hub.

Example of mobility hub



Example of cycle train



Examples of the use of HOKOMICHI



Logistics: low-carbon logistics and transportation

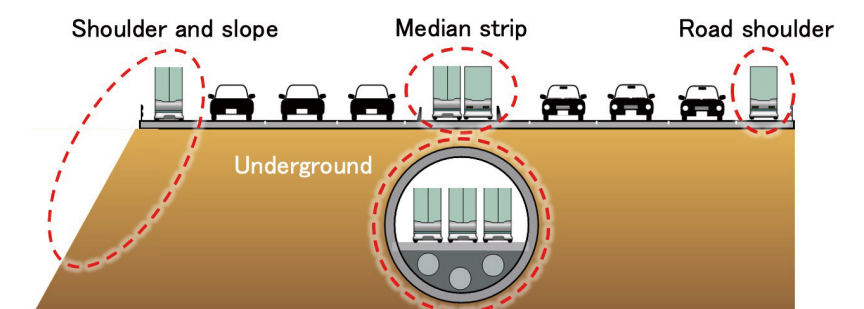
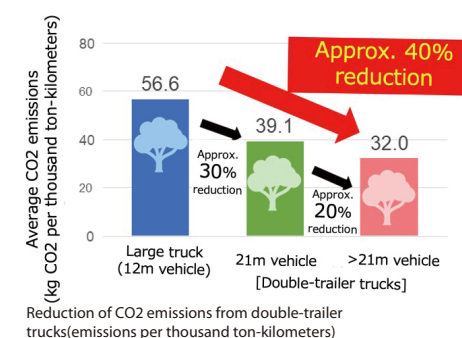
Based on operational conditions and operator needs, consider the expansion of routes for double-trailer trucks and promote the improved provision of parking space.

Promote the implementation of demonstration experiments and the development of relay bases for the practical application and diffusion of relay transportation.

Set up automated driving lanes on the Shin-Tomei Expressway and other expressways during late-night hours to realize automated truck driving through road-vehicle coordination.

Study on the construction of automated logistics roads with clean energy utilizing road space as a new form of logistics in which cargo is automatically transported.

Image of utilization of road space



Greening of road traffic

In light of the trend toward next-generation vehicles, we will expand initiatives for power generation, transmission, and supply in road spaces, in cooperation and collaboration with related ministries and agencies, to contribute to the spread of next-generation vehicles and improvement of the driving environment.

Background / data

- Status of EV charging facilities: as of April 2023
Michi-no-Eki: 875 (approx. 73%)
SA/PA: 400 locations (approx. 45%)
- Number of information signs for EV charging facility: as of April 2023
Michi-no-Eki: 331
SA/PA: 272 locations

Driving environment: promoting the development and popularization of next-generation vehicles

Consider relaxation of general limits on vehicle width and length, and revision of road structure standards for major roads connecting logistics centers, after confirming trends toward larger dimensions of next-generation vehicles.

Power generation: utilization of renewable energy

Promote the introduction of renewable energy sources such as solar power generation equipment on management facility buildings and road sites.

Power transmission: utilization of the road network to accommodate the power grid

Utilize road space to accommodate power grid and develop a wide-area coordinated power grid that are connecting areas with high potential for renewable energy and areas with electricity demand.

■ Utilization of road space to accommodate power grid
(Assuming undergrounding that does not interfere with traffic)



Kaikyō Bridge Akashi
Source: Kansai Transmission and Distribution website

Power supply: establishment of an environment for charging and recharging next-generation vehicles

Promote the spread of next-generation vehicles by cooperating in the installation of EV recharging facilities and hydrogen stations, and develop EV charging facility information signs.

EV chargers on expressways: 511 (2022) → approx. 1,100 (2025)
Target number of EV chargers at Michi-no-Eki: 898 (2022) → 1,000 - 1,500 (2030) (Ref. 1)

Ref. 1: Guidelines for Promoting the Development of EV Charging Infrastructure (October 2023: Ministry of Economy, Trade and Industry)

■ Large next-generation vehicle (image)



Source: Toyota Motor Corporation website

■ Solar power generation in road space



■ Information sign for EV charging facilities



■ Hydrogen station installed at Ashigara SA (outbound)



Low-carbonization of the entire road life cycle

We promote the reduction of CO2 emissions over the entire life cycle of road planning, construction, and management, including extending the service life of road infrastructure.

Background / data

- CO2 emissions from road construction: FY 2021
Approx. 13.3 million tons - CO2/year (approx. 1.3% of total domestic emissions)
- CO2 emissions from road maintenance: FY 2021
Approx. 1.4 million tons - CO2/year (approx. 0.1% of total domestic emissions)

Extending the service life of road infrastructure

Promote a low-carbon society by systematically extending the service life of infrastructure from the viewpoint of preventive maintenance and reducing the frequency of infrastructure renewal.

CO2 absorption and utilization of low-carbon materials

Promote road greening and better management through systematic maintenance and management of roadside trees.

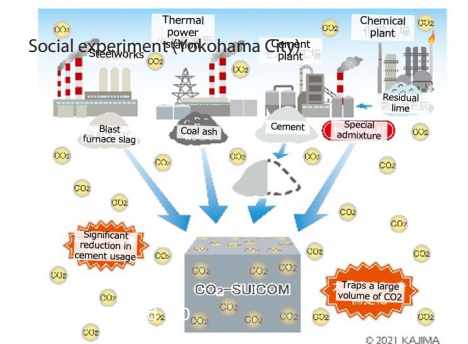
Promote the introduction of low-carbon materials.

■ Promotion of road greening



Yokohama City, Kanagawa Prefecture

■ Image of CO2 absorbing concrete



(Source: Kajima Corporation website)

Low-carbon road planning, construction, and management

Reduce CO2 emissions in road construction through innovations in construction methods, such as precasting, and the use of ICT construction.

Promote the introduction of next-generation patrol cars and other administrative vehicles, while taking into account the development status of heavy-duty vehicles.

Promote LED and advanced road lighting.

Complete conversion of national highways under jurisdiction of MLIT to LED lighting by FY2030 (approx. 40% at the end of FY2022).

Study on standardization of evaluation methods for CO2 emissions and reductions in the road sector.

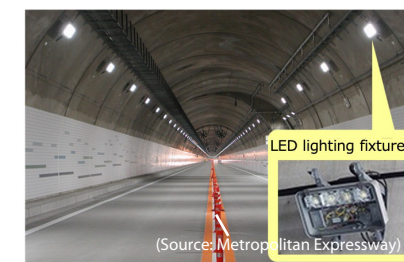
■ Utilization of ICT construction



■ Conversion of management vehicles to next-generation



■ Conversion of road lighting to LED



(Source: Metropolitan Expressway)

■ Image of advanced road lighting

