

# JRTT

## PROFILE



**Japan Railway Construction, Transport and Technology Agency**



## JRTT Provides Integrated Shinkansen Construction



Railway construction requires massive initial investments and long construction periods. Therefore, it is extremely difficult for modern private companies to assume the risks between investing and recovering capital. In addition, railway construction comprises an aggregation of various specialized skills. To successfully create the systems that ultimately provide safe, secure railway transportation, organizations with comprehensive technical capacity must manage all aspects to properly exhibit each specialized skill, including accounting, contracts, land, civil engineering, tracks, electricity, buildings, and machinery.

Toward that end, JRTT provides integrated construction of the Shinkansen lines based on a scheme by financial resources such as the rail access charge after construction and public expenditures from the national and local governments. Specifically, JRTT constructs Shinkansen lines

while coordinating closely with relevant government agencies and local governments, railway operators, and others as directed by the national government in each stage from the selection of Shinkansen routes to environmental impact evaluations, designs, land acquisition, and construction supervision. JRTT is the only group of railway engineers capable of assuming full responsibility for managing such a far-reaching railway network in its entirety.

To date, JRTT has constructed and opened the Hokkaido, Tohoku, Joetsu, Hokuriku, and Kyushu Shinkansen Lines. Presently, we are continuing with the construction of parts of the Hokkaido Shinkansen (between Shin-Hakodate-Hokuto and Sapporo), the Hokuriku Shinkansen (between Kanazawa and Tsuruga), and the Kyushu Shinkansen (between Takeo-Onsen and Nagasaki).

## Japan Railway Construction, Transport and Technology Agency (JRTT) Assists Railways and Coastal Shipping

### JRTT Assists Coastal Shipping



In an island nation such as Japan, coastal shipping underlies socioeconomic activity and people's lifestyles; it accounts for over 40% of the logistics throughout the country and transports roughly 80% of the steel, cement, petroleum products, and other supplies that form the foundation of Japanese industry. In addition, passenger ferries are crucial pieces of transportation infrastructure for transporting local residents and daily commodities.

Most coastal shipping companies are small and medium-sized companies. Nonetheless, they must take action in response to changes in the business atmosphere such as restructuring of the client industry, business trends, the intensification of safety regulations and other legislation, and technological innovations. To enable shipping companies

to respond to these changes, JRTT takes the approach of complementing private businesses with financial assistance as well as technical assistance from the planning stages of shipbuilding, a service unavailable with other financial institutions. This technical assistance takes the form of a joint ownership shipbuilding program that aims to equip coastal ship-owners with ways to properly respond to a variety of policy issues through the shipbuilding with facilities that improve working environments, ships that facilitate modal shifts, ships that contribute to carbon dioxide reduction, and others.



## JRTT Assists Urban and Regional Railways



JRTT has assisted third-sector and other railway operators that lack sufficient technical capacity and constructed urban and regional railways such as the Tsukuba Express and access lines to Tokyo International Airport, Narita International Airport, Kansai International Airport, Central Japan International Airport, and Sendai Airport. After the Great East Japan Earthquake struck, JRTT rushed to the scene to help with the reconstruction of the Sanriku Railway and other devastated infrastructure. JRTT is presently continuing construction of the Eastern Kanagawa Lines as set out in the Act on Enhancement of Convenience of Urban Railways, etc.

We are employing our capacity for managing railway lines in their entirety to conduct surveys for plans to construct new railway lines and other activities in response to requests from the national government,

local governments, and railway operators. We also assist in the development of facilities other than railways and ships by investing and lending funds. Besides, we play a role in financial assistance for the development of local public transportation.

In an effort to improve safety and convenience for railway passengers, encourage railway use and revitalize regional communities, we also accept subsidies from the national government to provide assistance for railway operators working on facility upgrades to improve railway networks and further improve convenience.

JRTT provides various assistance to JR 3 companies—JR Hokkaido, JR Shikoku, and JR Freight—to help them update outdated railway facilities and improve their business foundations.

Shinkansen High Speed Rail substantially shorten travel times and encourage the revitalization of regional economies. Urban railways uphold our cities and make them more appealing. Coastal shipping assists lifestyles and industry by safely transporting people and supplies. Each of these components of transportation infrastructure is vital toward ensuring that society continues to be an easy place to live.

To ensure the future of our transportation network, we must continue to assist transportation infrastructure—social capital that belongs to society.

Shinkansen and other railways and coastal marine transport operate 365 days a year on the strength of the efforts of various key people—railway operators and coastal ship-owners chief among them, but also including various manufacturers, construction and maintenance companies, and others.

JRTT plays its role in assisting the construction and improvement of this infrastructure and these facilities.

We at JRTT execute these tasks with a high level of ethics and in observance of laws, regulations, and the rules of society. We also accept the challenge to proactively engage in new efforts to respond to changes in society.

## JRTT Assists Overseas High-Speed Rail Construction



Many foreign countries proactively discuss and promote the construction of railways to mitigate environmental problems, road traffic in urban areas, and other issues; many countries throughout the world have high expectations of Japanese railway infrastructure technology.

In an effort to proactively capture this demand for railway infrastructure and translate it into robust economic growth for Japan, the Japanese government has established the Act on the Overseas Expansion of Infrastructure Systems and is taking other steps to spread Japanese high-speed rail and other railway infrastructure throughout the world.

JRTT intends to employ the capacity for Shinkansen construction project management it has cultivated to date to collaborate and cooperate with private companies to promote the development of high-speed rail systems globally.



# Japan Railway Construction, Transport and Technology Agency

## Basic Philosophy

### Contribute to Build Tomorrow's Transportation Networks.

We contribute to building safe, secure, eco-friendly transportation networks.

Our transportation network building helps improve people's lives and further develop economies and societies.

In the course of building transportation networks, we use our reliable technical capacity, abundant experience, and advanced expertise to the fullest.

## Code of Behavior

1. We accept the challenge to proactively engage in new efforts to respond to changes in society.
2. We take action responsibly, with a high level of ethics and in observance of laws, regulations, and the rules of society.
3. We increase the transparency and efficiency of our work to establish a deep trust.
4. Each and every one of us is fully aware of our roles, and we pool our energy and abilities to increase the strength of the team.
5. We work to improve ourselves through self-study in a highly motivating workplace.

Contents	<b>Infrastructure Development of Railway Construction</b>	6	<b>Infrastructure Development of Shipbuilding</b>	20
	Projected Shinkansen Lines	6	Joint Ownership Shipbuilding	20
	Urban Railways and Regional Railways	8	Technology Useful for the Development of Coastal Ships	22
	Disaster Restoration and Disaster Prevention Measures	10	Achievement of Shipbuilding	24
	Development of Technology	12		
	Attractive and Useful Station Space	14		
	Achievement of Railway Construction	16		
	Effects of Improvements	18		

## SUSTAINABLE DEVELOPMENT GOALS



The United Nations (UN) Sustainable Development Summit was held at the UN Headquarters in New York from September 25 through 27, 2015, where the ambitious agenda “Transforming Our World: 2030 Agenda for Sustainable Development” was adopted. This Agenda contained information and set goals as a plan of action to support people, the planet, and prosperity. These goals are the successor to the Millennium Development Goals (MDGs) and are called the Sustainable Development Goals (SDGs), consisting of 17 goals and 169 targets.

Contribute to Build Tomorrow’s Transportation Networks—this is JRJT’s fundamental philosophy. In other words, it means that there is the goal of constructing sustainable transportation networks. JRJT’s projects, which assist railways and domestic shipping, are activities in line with the SDGs’ philosophy.

JRJT will continue to contribute to the achievement of the SDGs by creating sustainable and resilient transportation networks.

Overseas Expansion of Railway Infrastructure System	26
Overseas Expansion Utilizing Railway Technology	26

Financing Assistance for Transport Infrastructure	28
Revitalization of Local Public Transportation Etc.	28
Japanese National Railways Settlement Administration	29

Environmental and Social Efforts	30
Environmental Efforts	30
Reduce Environmental Burdens through Development	32
Contribution for SDGs	33
Initiatives for Society	34

Corporate Overview of JRJT	35
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## Projected Shinkansen Lines

The Shinkansen is a far-reaching long-distance transportation network of high-speed railway lines in Japan. The Shinkansen connects each region safely and has played an important role in Japan's economic activities and people's social lives, including business and tourism in the areas along the railway lines, for many years.

### Construction of Projected Shinkansen Lines

“Projected Shinkansen Lines” refers to the Shinkansen lines established under the Development Program drafted in 1973 based on the Nationwide Shinkansen Railways Construction and Improvement Act.

JRTT is presently continuing construction work on 3 sections on 3 lines—the section between Shin-Hakodate-Hokuto and Sapporo on the Hokkaido Shinkansen, the section between Kanazawa and Tsuruga on the Hokuriku Shinkansen, and the section between Takeo-Onsen and Nagasaki on the Kyushu Shinkansen—and has already completed the construction of a total of 929 km of tracks on 4 other sections—the section between Shin-Aomori and Shin-Hakodate-Hokuto on the Hokkaido Shinkansen, the section between Morioka and Shin-Aomori on the Tohoku Shinkansen, the section between Takasaki and Kanazawa on the Hokuriku Shinkansen, and the section between Hakata and Kagoshima-Chuo on the Kyushu Shinkansen.

A portion of the rail access charge is applied to finance the construction of Projected Shinkansen Lines, and the national government provides financing for 2/3 of the remainder while local governments cover 1/3.

#### Kyushu Shinkansen between Takeo-Onsen and Nagasaki

[66km]

We began construction on this section with scheduled completion in around 10 years after the government approval.

We are continuing construction work for completion around the fall of 2022.



Hakamano Bridge in Saga Prefecture

#### Hokuriku Shinkansen between Kanazawa and Tsuruga

[125km]

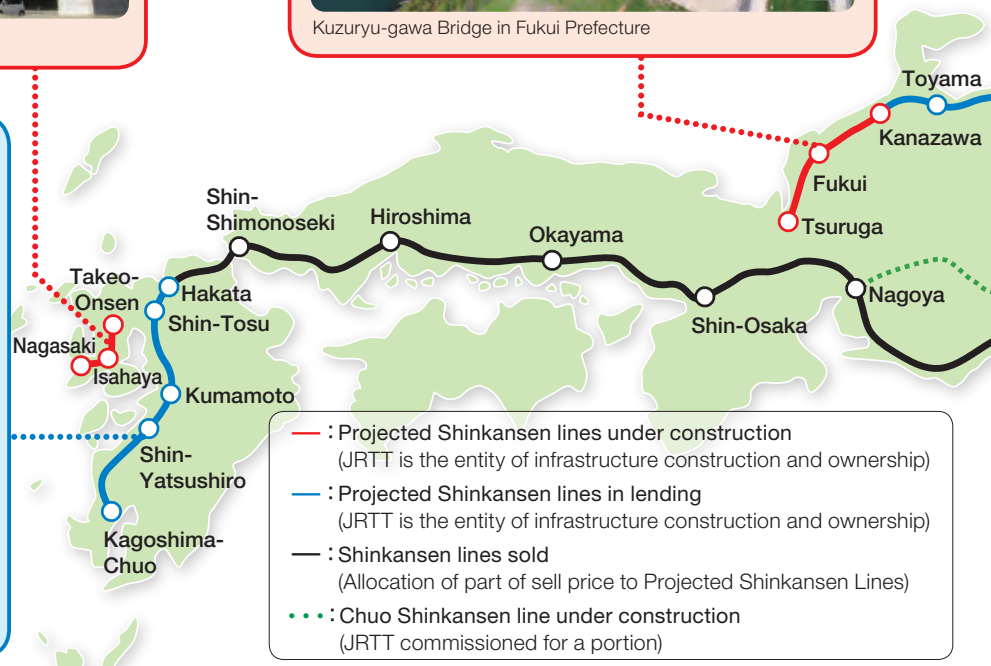
We began construction on this section with scheduled completion in around 10 years or a little longer after the opening of the section between Nagano and Kanazawa Stations. We are continuing construction work for completion around the spring of 2024.



Kuzuryu-gawa Bridge in Fukui Prefecture

#### Kyushu Shinkansen between Hakata and Kagoshima-Chuo

[257km]



## Hokkaido Shinkansen between Shin-Aomori and Shin-Hakodate-Hokuto

[149km]



## Hokkaido Shinkansen between Shin-Hakodate-Hokuto and Sapporo

[212km]

We began construction on this section with scheduled completion in 20 years after the opening of the section between Shin-Aomori and Shin-Hakodate-Hokuto Stations.

In January 2015, the national government and ruling parties agreed to complete the railway line by FY 2030, five years earlier than scheduled, and we are continuing construction work for completion.



Oshima Tunnel in Hokkaido Prefecture

■ In addition to Projected Shinkansen lines, the Japan Railway Construction Public Corporation—the predecessor of JRJT—constructed the Joetsu Shinkansen (the roughly 270-km stretch between Omiya and Niigata Stations), and JRJT is continuing construction work on the portion of the Chuo Shinkansen (between Shinagawa and Nagoya) commissioned to it by the Central Japan Railway Company.

## Lease of Projected Shinkansen Lines

JRJT retains ownership of the infrastructure after construction and leases it to each of the JR companies, which operate and manage the lines by paying rail access charges according to the benefit principle.

## Hokuriku Shinkansen between Takasaki and Kanazawa

[345km]



## Tohoku Shinkansen between Morioka and Shin-Aomori

[178km]





## Urban Railways and Regional Railways

We are building far-reaching railway networks to bridge urban and regional railways, and are also providing assistance to railway operators and others in an effort to effectively share with society the railway construction technology and other advantages we have cultivated from our experience throughout the years.

### ● Projects to Enhance the Convenience of Urban Railways

These new projects are implemented under the Act on Enhancement of Convenience of Urban Railways, etc., which was enacted in 2005. Under these projects, we build new through lines while effectively using existing railway infrastructure to eliminate the need for transfers and improve promptness, thereby improving convenience for passengers.

The national government, local governments, and the entity of construction companies each provide 1/3 of the financing for these improvements.

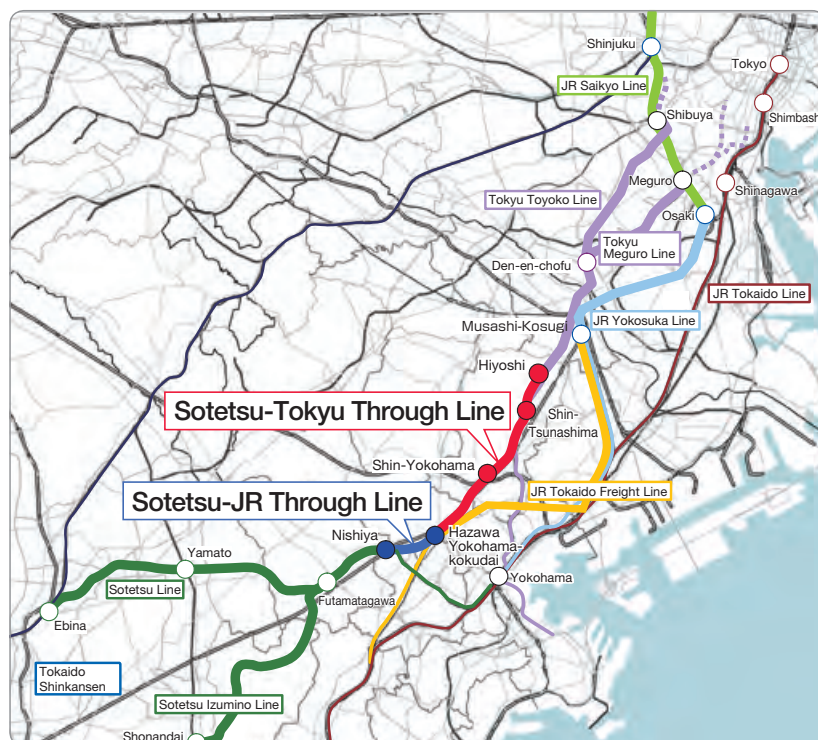
After lines open, the entity of construction retains ownership of the infrastructure and leases it to the entity of operation, which then remits rail access charge to the entity of construction.

### Eastern Kanagawa Lines (The Sotetsu-JR Through Line/ Sotetsu-Tokyu Through Line)

The through lines between Sotetsu and JR/Sotetsu and Tokyu are new through lines in a project to improve access from western Yokohama City and central Kanagawa Prefecture to central Tokyo, and JRJT is proceeding with the construction as the entity of construction. The Sotetsu-JR Through Line connects Nishiya Station on the Sotetsu Line to the area near Yokohama-Hazawa Freight Station on the JR Tokaido Freight Line, and the Sotetsu-JR Through Line connects Hazawa Yokohama-Kokudai Station to Hiyoshi Station on the Tokyu Line.

Sagami Railway Company is the entity of operation for the Sotetsu-JR Through Line, which came into operation on November 30, 2019. Sagami Railway Company, Ltd. and TOKYU Corporation jointly manage the Sotetsu-Tokyu Through Line, which will come into operation in the second half of FY 2022.

In addition, we have used green bonds to finance part of this project. For more details, please see the page about environmental efforts.



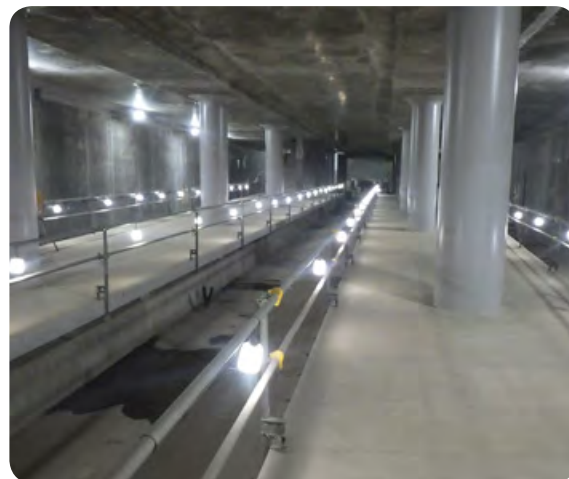
Line Map for the Sotetsu-JR Through Line / the Sotetsu-Tokyu Through Line



Sotetsu-JR Through Line  
Hazawa Yokohama-Kokudai Station



Conceptual Drawing of Completed Shin-Yokohama Station (tentative name) on the Through Line between Sotetsu and Tokyu



Shin-Yokohama Station (tentative name) on the Sotetsu-Tokyu Through Line



## ● Research and Assistance for Railway Planning

JRTT conducts various research using GRAPE and other assistance systems in response to requests from the national government, local governments, railway companies, and others.

### GRAPE Transportation Plan Assist System

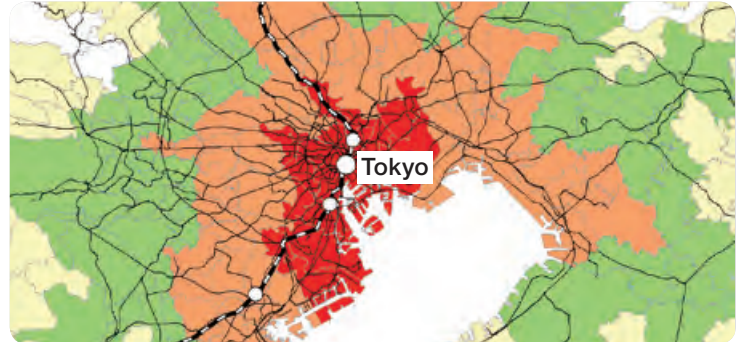
GRAPE\* is a geographic information systems (GIS)-based system that assists transportation planning, primarily for railways. In addition to new railway projects, GRAPE assists with the analyzing and evaluating of railway convenience improvements, such as transfer streamlining and revising train schedules.

GRAPE: GIS for Railways Project Evaluation

● Awards: Japan Society of Civil Engineers Innovative Technique Award (2002)

### Feasibility Study Evaluations of Railway Routes etc.

From a neutral position as a public institution, JRTT conducts various studies, including those on route selection, operation planning, facility planning, and demand forecasting, as well as analyzes of feasibility and socio-economic effects.



Evaluation of convenience using an isochrone map for travel time to/from Tokyo

## ● Comprehensive Assistance for Railway Facilities

### JRTT Railway Family Doctor: Technical Assistance for Railway Operators

For repairs, maintenance, and other tasks involving railway structures, we send engineers into the field to conduct surveys as necessary and introduce construction methods, materials, and other information suited to the circumstances, provide an assistance system suited to the conditions, and provide other advice. We also provide data for present-state analysis of areas around railways and the like.



Cracks inside a tunnel



A field survey in progress



A field survey in progress

## ● Contract Work Utilizing Technological Capabilities

JRTT conducts contract work, such as the construction and expansion of railway facilities as well as various surveys, in response to requests from local governments, railway companies, etc. Furthermore, JRTT can utilize a particular design institution. Even if a railway operator does not meet certified railway business operators' criteria based on the Railway Business Act, the railway operator may take a simplified procedure when applying for approval to construction work. Therefore, it is possible to reduce the burden on railway operators.



Construction of the Chuo Shinkansen



Elevation of the Echizen Railway



Construction of the Narita Sky Access Line



Construction of the Sendai Subway Tozai Line

# Disaster Restoration and Disaster Prevention Measures

Using its technological capabilities, JRTT provides assistance in disaster recovery and undertakes disaster prevention measures for railways damaged by earthquakes and torrential rains.



Residents of a community on the line blessing a commemorative train car at Shimanokoshi Station

## Disaster Restoration Work for Railway

JRTT engineers conduct field surveys in response to the needs of businesses that do not have sufficient engineers for railway facilities, such as third-sector railway operators. Furthermore, JRTT contributes to railway disaster recovery through technical support, including recovery planning, design verification, and construction supervision.

### Sanriku Railway Lines Restoration Work from Disaster Caused by the Great East Japan Earthquake

Construction work sections: Kita-Rias Line, between Miyako and Kuji  
 Number of stations: 16 Length: 71.0km  
 Minami-Rias Line, between Sakari and Kamaishi  
 Number of stations: 10 Length: 36.6km

Description of work: Civil engineering, construction of tracks, architecture, and machinery equipment for the rolling stock yard in the commissioned work sections

Period of work: November 1, 2011. to September 30, 2014

The significant shaking and the enormous tsunami waves generated by the Great East Japan Earthquake on March 11, 2011, caused destructive damage to the Sanriku Railway lines.

Sanriku Railway Company entrusted JRTT to perform restoration work, and with cooperation from Sanriku Railway Company, local governments, and other relevant organizations, we performed construction work on a short schedule of two-and-a-half years, and successfully reopened all lines as planned, starting with the section of the Kita-Rias Line between Tanohata and Rikuchu-Noda on April 1, 2012, and followed by the section of the Minami-Rias Line between Sakari and Yoshihama on April 3, 2013, the section of the Minami-Rias Line between Yoshihama and Kamaishi on April 5, 2014, and the section of the Kita-Rias Line between Omoto and Tanohata on April 6, 2014.

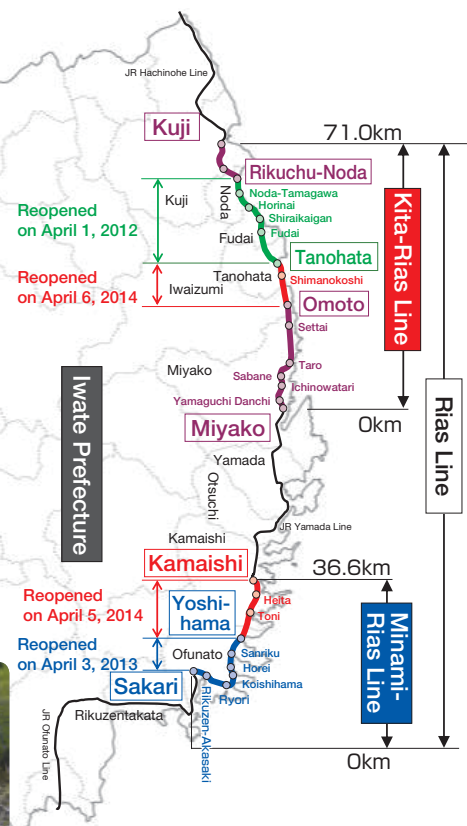
● Awards: Japan Society of Civil Engineers Outstanding Civil Engineering Achievement Award (2014), Japanese Geotechnical Society Technical Excellence Award (2014)



Area near Shimanokoshi Station immediately after the disaster (Kita-Rias Line)



Arakawa Bridge immediately after the disaster (Minami-Rias Line)



### Assistance for the Minami Aso Railway in Recovery from Disaster Caused by the Kumamoto Earthquakes

The Minami Aso Railway was severely damaged by the Kumamoto Earthquake that occurred in April 2016. To restore the entire line, JRTT received a request for assistance from Kumamoto Prefecture and Minami Aso Railway Company and conducted a field survey. JRTT provided technical assistance for the design verification and replacement of the Daiichi Shirakawa Railway Bridge.



Disaster-damaged Daiichi Shirakawa Railway Bridge on Minami Aso Railway



## Sendai Airport Access Line Restoration Work from Disaster Caused by the Great East Japan Earthquake

The Sendai Airport Access Line opened on March 18, 2007. The damage the line suffered due to the Great East Japan Earthquake on March 11, 2011, was so massive that operations had to be suspended on the entire line.

We provided full technical support for the restoration of railway facilities damaged by the East Japan Earthquake. The Miyagi prefectural government and Sendai Airport Transit Company requested our assistance, and we provided technical assistance on all fronts for the recovery through efforts to conduct field surveys immediately after the earthquake, to accepting engineers from Sendai Airport Transit Company in April 2011 to restoration measures, manage restoration work, and survey the soundness of existing structures. And more, we also established an assistance system within our organization and made other efforts to cooperate with the soonest possible restoration of the Sendai Airport Access Line, reopening the section of the line between Natori and Mitazono on July 23, 2011, and finally reopening the entire line through to Sendai Airport Station on October 1, 2011.



Local Children Leading a Departure Ceremony (Sendai Airport Station)

● Awards: Japan Railway Award (2011)



Tracks displaced, joints misaligned (inside the Airport Tunnel)



Destroyed electrical equipment, noise barriers, etc. (near the Entrance to the Airport Tunnel)



## ● Safety Measures and Disaster Prevention Measures

### Preserving the Seikan Undersea Tunnel

We are upgrading the earthquake disaster prevention facilities, drainage facilities, fire detectors, fire extinguishing equipment, evacuation guidance facilities, transformer substation facilities, and other facilities necessary for preserving the tunnel.



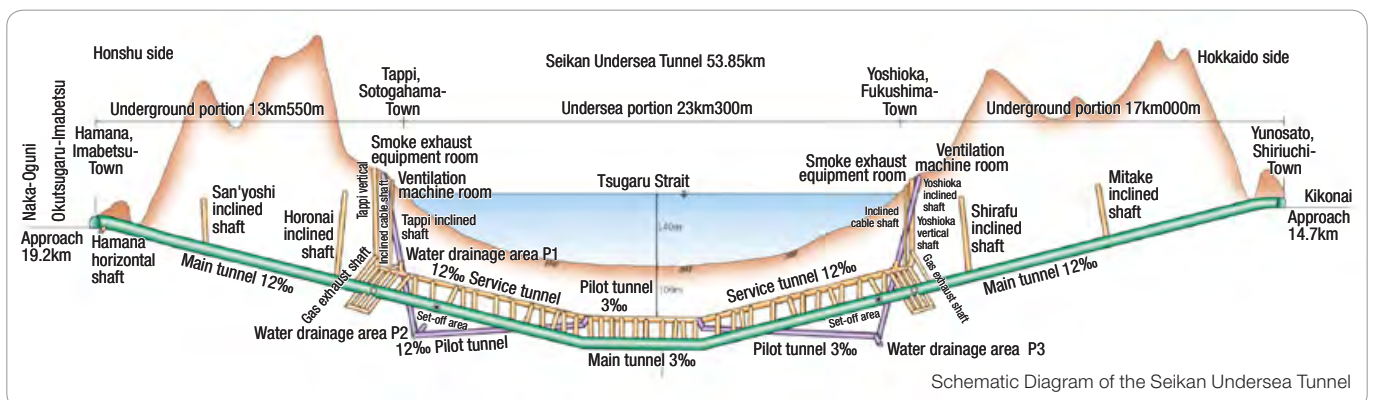
Seikan Undersea Tunnel entrance (Honshu side)



Renewal of pump equipment to drain tunnel spring water



Pile tunnel repairs



Schematic Diagram of the Seikan Undersea Tunnel

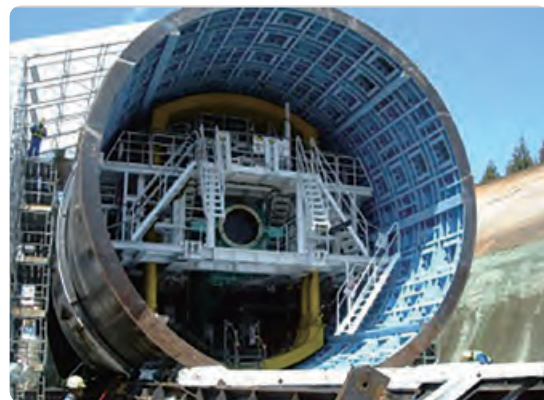
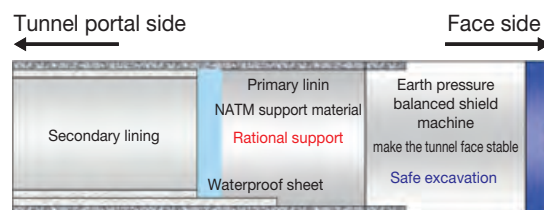
# Development of Technology

## SENS (Casting Support Tunneling System Using TBM)

SENS stands for Shield tunnel method (TBM) ECL NATM System. It is a new tunnel construction method that combines the advantages of these methods. The face stability from the Shield tunnel Method (TBM) is combined with cast-in-place concrete from the ECL Method and the support from NATM. Using this method make it possible that we excavate in safety and economically a tunnel, which could be adopted both the NATM and the shield tunnel method.

SENS was applied for the first time to the Sanbongihara Tunnel on the Tohoku Shinkansen (between Hachinohe and Shin-Aomori). We have succeeded in high-speed excavation for the Tsugaru-Yomogita Tunnel on the Hokkaido Shinkansen (between Shin-Aomori and Shin-Hakodate-Hokuto) and also an application to urban areas on the Nishiya Tunnel on the Sotetsu-JR Through Line. It is also used in the Hazawa Tunnel on the Sotetsu-Tokyu Through Line, as well as the Yotei Tunnel on the Hokkaido Shinkansen (between Shin-Hakodate-Hokuto and Sapporo).

●Awards: Japan Society of Civil Engineers' Outstanding Civil Engineering Achievement Award (2006, 2012), Japan Industry and Technology Award Judging Committee's Special Award (2007)



Tubular form

## GRS-Integrated Bridges

The Geosynthetic-Reinforced Soil (GRS) integrated bridges are combining of the bridge girders, the abutments, and the embankments (cement improvement approach blocks) behind the abutments reinforced with geosynthetics (net shaped material made of reinforcement material, laid in sheets within the embankment). The resulting gate-shaped structure requires no support members, which provides benefits such as reduced construction costs and lower maintenance workloads.

We utilized the technology of geosynthetic-reinforced soil (GRS) integration for the first time on the Chugakko Line Overpass between Shin-Aomori and Shin-Hakodate-Hokuto on the Hokkaido Shinkansen. Since then, it has been adopted in three locations during the Sanriku Railway restoration work because it has a structure that is resistant to tsunami waves. Among these, we succeeded in expanding the Haipesawa Bridge with a composite girder structure of steel and concrete. We also successfully expanded the Genshu Overpass on the Kyushu Shinkansen (between Takeo Onsen and Nagasaki) with a pre-stressed concrete girder structure.

●Awards: Japan Society of Civil Engineers Innovative Technique Award (2019), Japan Society of Civil Engineers Tanaka Award (2014), The Japanese Geotechnical Society Outstanding Professional Contribution Award (2013, 2014)

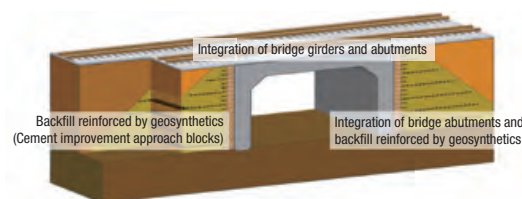


Diagram of a GRS-Integrated Bridge



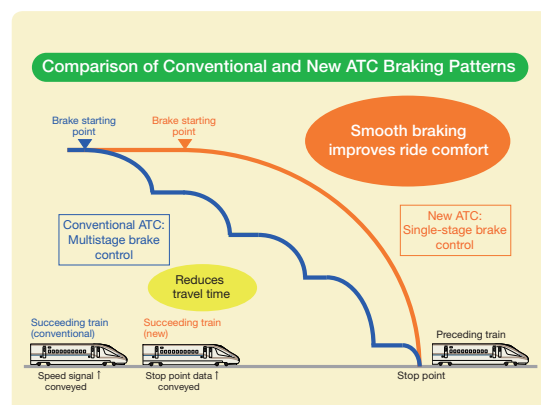
Haipesawa Bridge, Sanriku Railway

## Train Control System with Improved Ride Comfort

We introduced an on-board oriented automatic train control (ATC) system on Tohoku Shinkansen between Morioka and Hachinohe to improve ride comfort and to shorten headway. On the extension of this line between Hachinohe and Shin-Aomori, based on this system, to simplify wayside equipment and facilitate maintenance works, we employed a non-insulated track circuit entirely to the Shinkansen line for the first time.

With these improvements, we advanced this system to be applicable in sections where two power sources different in frequency exist between Nagano and Kanazawa on the Hokuriku Shinkansen. Also, on the Hokkaido Shinkansen between Shin-Aomori and Shin-Hakodate-Hokuto, we introduced an ATC system compatible with the dual-track section where the conventional line and the Shinkansen line run together.

●Awards: Japan Railway Electrical Engineering Association Railway Electrical Engineering Award (2015)





## ● Snow Prevention Equipment

We have developed and installed equipment for snow damage countermeasures for the Shinkansen according to the local weather conditions, contributing to stable transportation in winter.

● Awards: Japan Society of Civil Engineers Outstanding Civil Engineering Achievement Award (2016)



Rapid snow removal equipment      Equipment that rapidly removes snow that falls from rolling stock onto point frogs (Hokkaido Shinkansen)



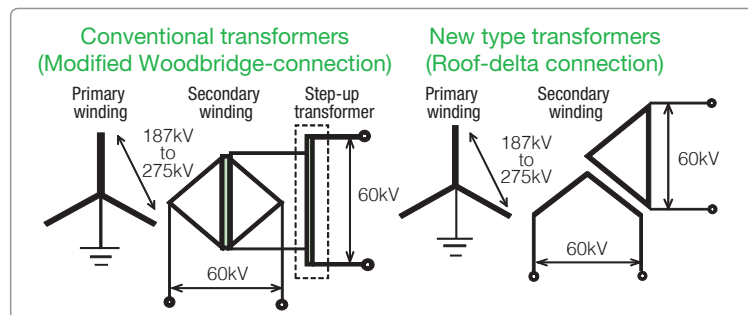
Snow removal sprinklers (Hokuriku Shinkansen)

## ● Eco-Friendly Roof-Delta Connected Transformers

To alternate conventional transformers that receive over 170 kV power for Shinkansen lines-modified Woodbridge-connected transformers-we practicalized and employed roof-delta connected transformers.

Compared to the conventional, the new transformer has a simpler structure which enables to be not only smaller and lighter but also more power efficient, more economically and eco-friendly.

● Awards: Japan Electric Association Shibusawa Award (2016)



Shin-Hakodate Substation

## ● Technical Research for Railway Construction

### Promotion of Technological Development for High-quality Railways

To develop better railway facilities, JRJT has taken up technological development themes based on needs as issues in each field. JRJT is proceeding with technological development that contributes to improving its technological capabilities of railway construction.

#### Nine Subcommittees

Prospective Study	Mountain Tunnel	Urban Tunnel
Bridge	Earth Structure	Track
Machinery	Architecture	Electricity

### Participation in Various Academic Societies and Presentation of Papers

JRJT publishes the results of its technological development, actively participates in various academic societies related to construction technology, and strives to submit and publish papers so that JRJT's technology peculiar to railway construction can be appropriately understood externally.

### Technical Study Conference

Every year, the members of the Technical Study Group present themes related to railway construction work. The purpose of the Technical Study Group is to widely convey its development results related to railway construction technology to society and maintain, develop, and improve the railway construction technology as the basis of railway construction.



Technical Study Conference for presentations of each section

## Attractive and Useful Station Space

JRTT uses its experience in constructing numerous station buildings while considering the opinions of residents and local governments. JRTT is developing railway stations to be attractive and easy to use and serve as the gateways to cities.

### Universal Design for Stations that are Accessible and User-Friendly for Everyone

We incorporate the principles of universal design—seeking to create facilities that are accessible and user-friendly for everyone regardless of age, gender or ability—into our improvement of stations while considering economic efficiency from the very start of the planning and design stages.

#### Safety Platforms

We design platforms with good visibility and adequate space for passenger traffic. We install platform edge doors to keep passengers safe from passing trains and prevent them from falling onto the tracks.



Shin-Tosu Station, Kyushu Shinkansen



Shin-Hakodate-Hokuto Station, Hokkaido Shinkansen

#### Intuitive Visible Concourses

We design concourses with bright lighting and great visibility. We locate stairs, elevators, and escalators so that they are easy for passengers to find, and install informational signage, textured paving blocks, and more.



Hazawa Yokohama Kokudai Station, Sotetsu-JR Through line



Iiyama Station, Hokuriku Shinkansen

#### Easy-to-use Lifting Equipment

Each elevator is fitted with glass panels and a security camera to improve visibility and security. They are large enough to accommodate wheelchairs and strollers. Furthermore, we installed escalators and stairs so that users can choose how they like to go up and down.



Shin-Tamana Station, Kyushu Shinkansen



Toyama Station, Hokuriku Shinkansen

#### Accessible Multifunctional Restrooms

We install fold-out beds, ostomate toilets, and other facilities inside multifunctional toilets, and equip both men's and women's toilets with simple, multipurpose stalls that are wheelchair accessible. We also install flashing lights to inform people with hearing impairments of emergencies.



Toyama Station, Hokuriku Shinkansen

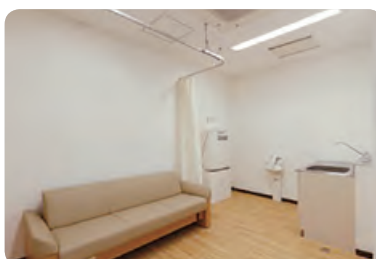


Kikonai Station, Hokkaido Shinkansen

#### Convenient Multipurpose Rooms

Within Shinkansen station buildings, we install multipurpose rooms for passengers to nurse infants, rest when they do not feel well, and other purposes.

For nursing, in particular, we take care to install baby changing stations, sinks, curtains for privacy, and other facilities.



Chikugo-Funagoya Station, Kyushu Shinkansen



Kikonai Station, Hokkaido Shinkansen



## Considering Universal Design together with users

JRTT works with local governments to exchange opinions with local civic groups in order to incorporate various approaches to universal design into station improvements.

### Universal Design Flow Chart

Local civic groups (older/elderly people, people who use wheelchairs, etc.)



Local governments  
(station front)

JRTT (station)

- ① Universal design plan proposal
- ② Meeting to exchange opinions
- ③ Facilities that reflect those opinions



Shin-Hakodate-Hokuto Station, Hokkaido Shinkansen

## Building Interiors Created from Locally Sourced Materials to Express the Local Flavor

Stations are the first buildings to welcome travelers to a local area. Therefore, the most common request from communities is for stations that express the local flavor. In response, we aim to use locally sourced materials (locally produced materials and local craftwork) in building interiors in an effort to create stations that express the local flavor and are loved by the members of the community. In consideration of economic efficiency, we also accept locally sourced materials and the like from communities as much as possible.

### Use of Locally Produced Materials

Our frequent use of locally sourced wood in building interiors creates atmospheres with a sense of warmth, which makes stations feel more inviting and also leads to CO2 fixation, which makes stations even eco-friendlier.

We also use locally sourced stones, metals, and other materials, in addition to wood.

Brass, Gokayama-washi Japanese paper



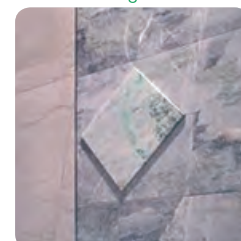
Shin-Takaoka Station,  
Hokuriku Shinkansen

Marble from Oritate



Kurobe-Unazukionsen Station,  
Hokuriku Shinkansen

Jade from Itoigawa



Itoigawa Station,  
Hokuriku Shinkansen

Aomori Hiba (cypress) screen



Okutsugaru-Imabetsu Station,  
Hokkaido Shinkansen

Donan (Southern Hokkaido) cedar



Shin-Hakodate-Hokuto Station,  
Hokkaido Shinkansen

Cedar from Fukui Prefecture



Fukui Station, Echizen Railway

### Use of Local Craftwork

We use textiles, Japanese paper, lacquerware, and ceramics in building interiors, and these local crafts bring benefits in terms of economic efficiency, design appeal, durability, and ease of maintenance.

Birutani-washi Japanese paper



Kurobe-Unazukionsen Station,  
Hokuriku Shinkansen

Tsugaru-nuri lacquerware relief



Shin-Aomori Station, Tohoku Shinkansen

Traditional craftwork in Ishikawa Prefecture



Kanazawa Station, Hokuriku Shinkansen

# Achievement of Railway Construction

JRTT continues to construct Shinkansen lines of the national transport system, urban railways, and other integral elements of the national transportation system.

## Major Achievement of Railway Construction

Over the 50-plus years since the establishment of the Japan Railway Construction Public Corporation (JRCC)—the predecessor to JRTT—in 1964, we have constructed a total length of over 3,600 km on 120 or more railways, including the Hokkaido Shinkansen and other Shinkansen lines, the Tsugaru-Kaikyo Line, JR lines, private railways, and subways entrusted to us by local governments and others. Over that period, we have received many awards from domestic and international organizations alike.



Tsugaru-Kaikyo Line (Seikan Tunnel)

● Awards: Commendation by the Prime Minister (1987), others



Hokuriku Shinkansen

● Awards: Japan Society of Civil Engineers Outstanding Civil Engineering Achievement Award (2015), others



Joetsu Shinkansen

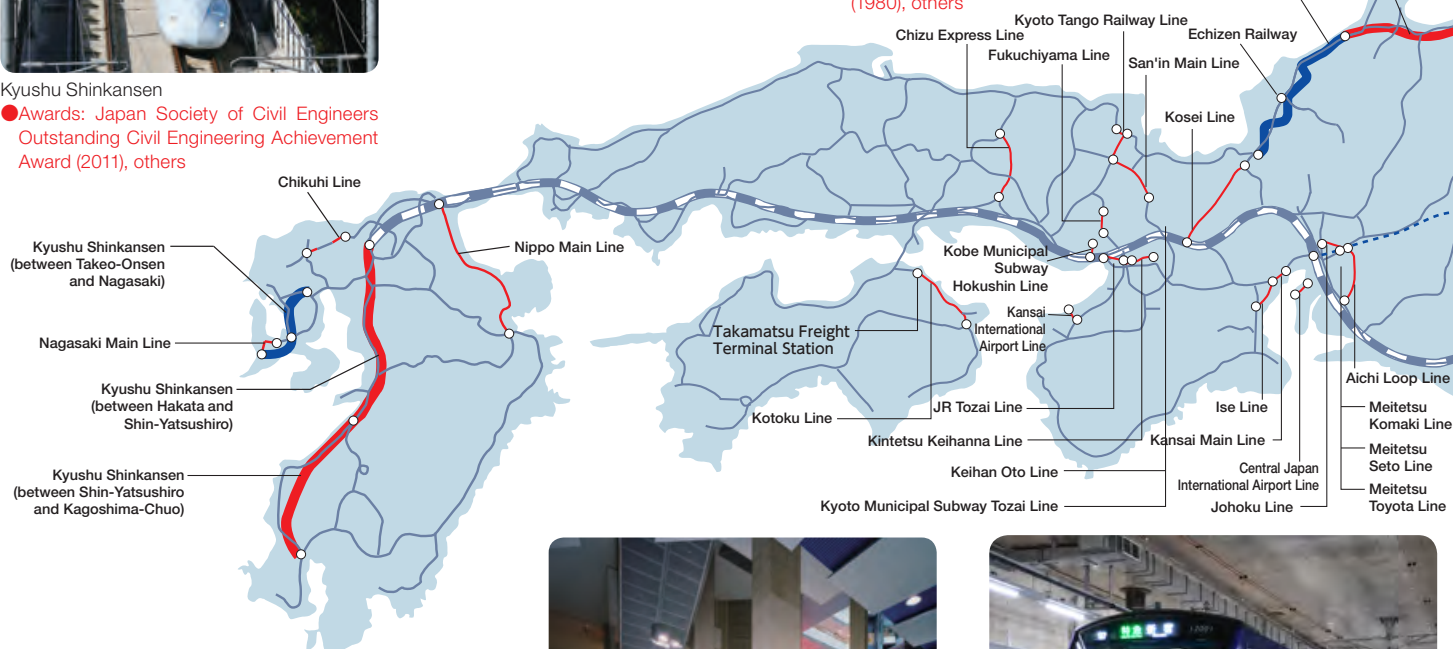
● Awards: Japan Society of Civil Engineers Outstanding Civil Engineering Achievement Award (1980), others

Hokuriku Shinkansen (between Kanazawa and Tsuruga)



Kyushu Shinkansen

● Awards: Japan Society of Civil Engineers Outstanding Civil Engineering Achievement Award (2011), others



### Major Railway Lines Developed by JRTT

- Shinkansen lines in operation
- Shinkansen lines under construction
- Conventional lines in operation
- Conventional lines under construction

### Major Lines in Operation

- Shinkansen Lines
- Conventional Lines



Minatomirai Line

● Awards: Brunel Awards Commendation (2005), others



Sotetsu-JR Through Line

● Awards: Japan Society of Civil Engineers Outstanding Civil Engineering Achievement Award (2020), others





Hokkaido Shinkansen

● Awards: Japan Society of Civil Engineers Outstanding Civil Engineering Achievement Award (2012), others

Hokkaido Shinkansen

(between Shin-Aomori and Shin-Hakodate-Hokuto)

Tsugaru-Kaikyo Line

Tohoku Shinkansen

(between Hachinohe and Shin-Aomori)

Tohoku Shinkansen

(between Morioka and Hachinohe)

Tazawako Line

Ou Main Line

Joetsu Shinkansen

(between Omiya and Niigata)

Hokuriku Shinkansen

(between Takasaki and Nagano)

Hokuhoku Line

Gakuen-Toshi Line

Hokkaido Shinkansen  
(between Shin-Hakodate-Hokuto and Sapporo)

Nemuro Main Line

Sekisho Line

Sanriku Railway Lines

Sendai Subway Namboku Line

Sendai Subway Tozai Line

Sendai Airport Access Line

Abukuma Express Line



Tsukuba Express Line

● Awards: Universal Accessibility Excellence Award (2005), others



Tohoku Shinkansen

● Awards: Japan Society of Civil Engineers Outstanding Civil Engineering Achievement Award (2010), others



Narita Rapid Rail Access Line (Narita Sky Access Line)

● Awards: Japan Society of Civil Engineers Outstanding Civil Engineering Achievement Award (2010), others

Tokaido Freight Line  
(between Tokyo Freight Terminal and Osaka Freight Terminal)

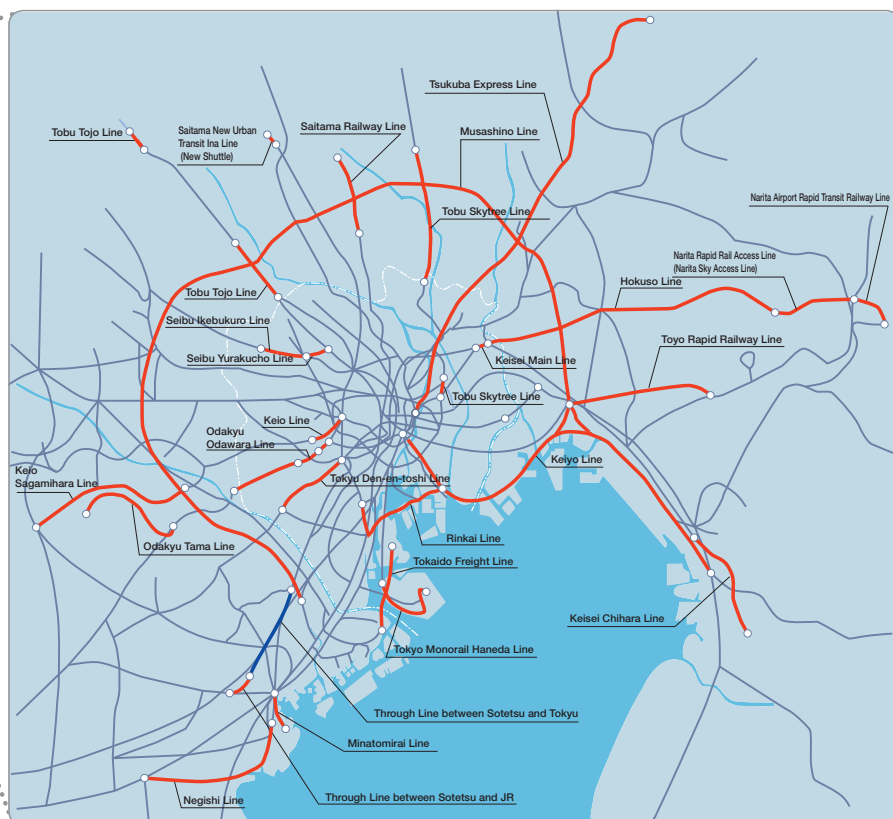
Yamanashi Maglev Test Line

Commissioned portion of the Chuo-Shinkansen between Shinagawa and Nagoya under construction



Rinkai Line

● Awards: Association of Railway Architects Ministry of Transport Railway Bureau Director-General Award (1996), others



## Effects of Improvements

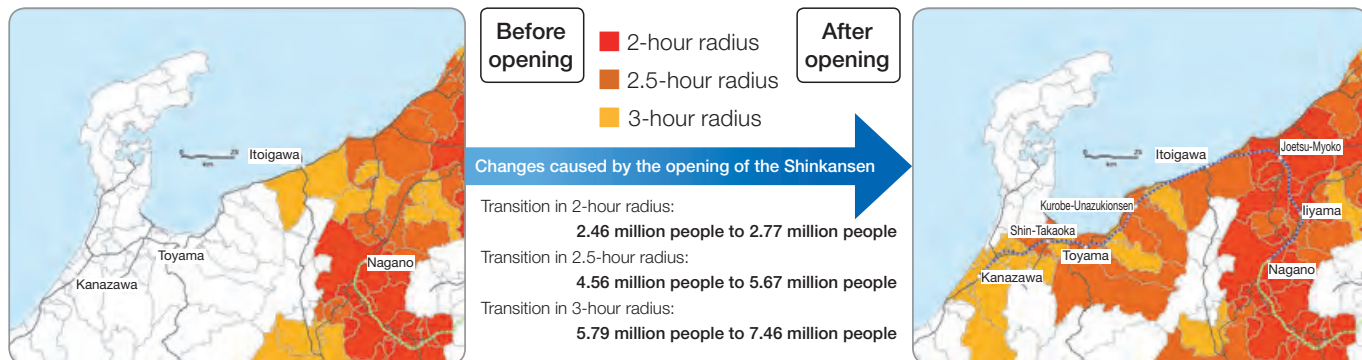
By developing railway networks, JRJT contributes to prompt and convenient accessibility between cities and community development.

### Travel Time

Shortening travel time leads to expanded ranges of activity and makes it possible to transport many people more rapidly.

#### Hokuriku Shinkansen (between Nagano and Kanazawa)

#### Travel Time to Tokyo Station

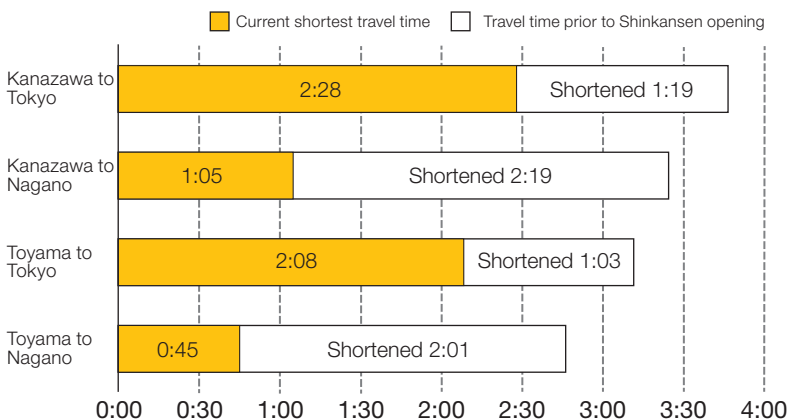


Note: "Transition to 2.5-hour radius" is the total population of the 2-hour radius and the 2.5-hour radius; "Transition to 3-hour radius" is the total population of the 2-hour radius, the 2.5-hour radius, and the 3-hour radius.

Sources: The 2015 Population Census (Totals for municipalities as of March 2015)

For travel time, timetables were used to calculate the time required to access Shinkansen stations from administrative offices in each municipality. The timetable published in March 2014 was used for the period before opening, and the timetable published in March 2015 was used for the period after opening.

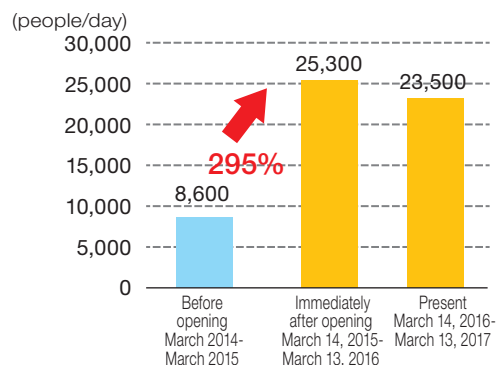
#### Shortening Travel Time



Sources: The timetable published in March 2014 was used for the period before opening, and the timetable published in March 2017 was used for the present

#### Changes in Average Number of Passengers

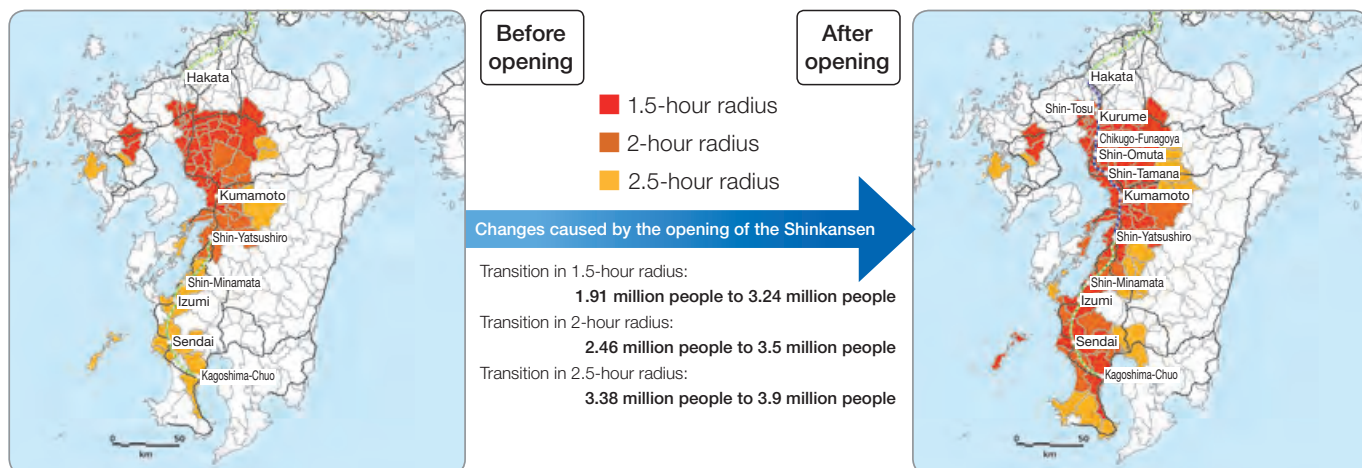
##### Between Joetsumyoko and Itoigawa



Sources: Estimates prepared based on news releases from the West Japan Railway Company, newspaper articles, etc.

#### Kyushu Shinkansen (between Hakata and Kagoshima-Chuo)

#### Travel Time to Hakata Station



Note: "Transition to 2.5-hour radius" is the total population of the 2-hour radius and the 2.5-hour radius; "Transition to 3-hour radius" is the total population of the 2-hour radius, the 2.5-hour radius, and the 3-hour radius.

Sources: The 2015 Population Census (Totals for municipalities as of March 2015)

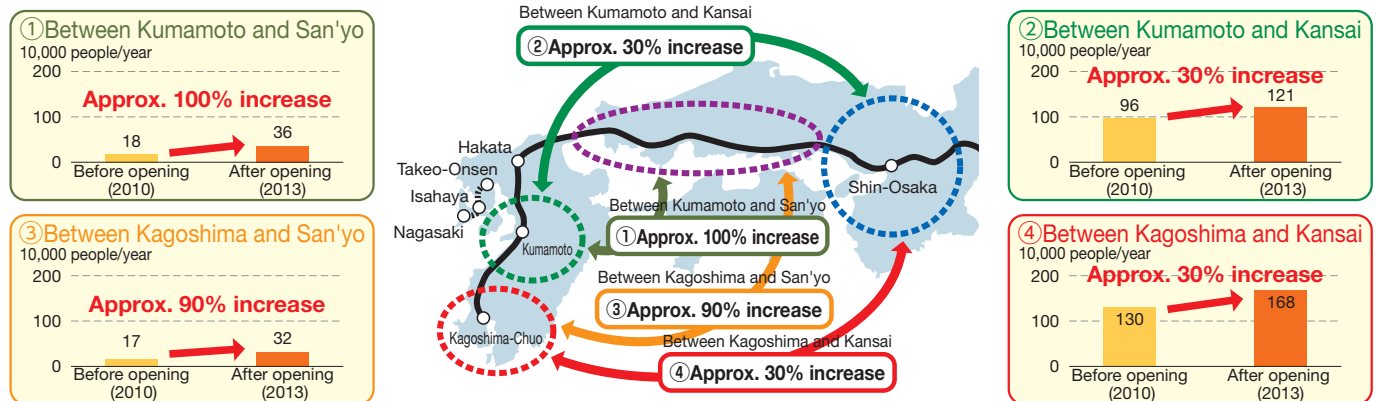
For travel time, timetables were used to calculate the time required to access Shinkansen stations from administrative offices in each municipality. The timetable published in March 2014 was used for the period before opening, and the timetable published in March 2015 was used for the period after opening.



## ● Increase of Human Interaction between Regions

The increase in human interaction between regions has contributed to regional economic developments.

### Kyushu Shinkansen (between Hakata and Kagoshima-Chuo) Flow volume between regions before and after the full opening



## ● Development of Regional Communities

### Narita Sky Access Line (between Inba-Nihon-Idai and Narita Airport)

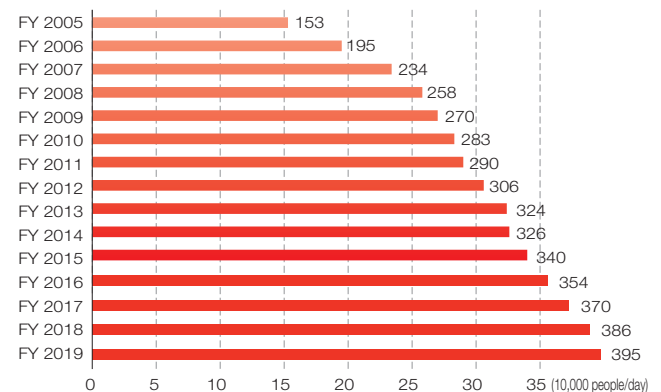
With the opening of the Narita Sky Access Line, the time required from the central part of Tokyo to Narita Airport has been shortened to 36 minutes. The number of passengers has doubled in the 9th year since the opening, with an increase in the number of trains.

Source: Created based on data from Narita Rapid Rail Access Company.



### Tsukuba Express Line (between Akihabara and Tsukuba)

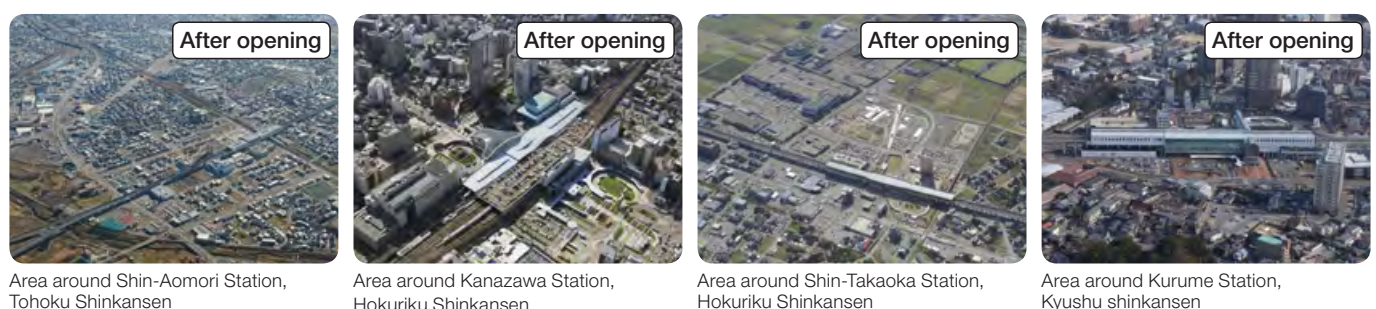
The continual construction of housing and the opening of a large shopping mall along the Tsukuba Express Line produced a 150% increase in passengers in the line's first 15 years after opening.



Source (images/graph): Created based on data from the Metropolitan Intercity Railway Company

### Development along with the Opening of Shinkansen Stations

The areas around the Shinkansen railway stations are being revitalized, including the urban development of local municipalities and the opening of various facilities of private companies.



## Joint Ownership Shipbuilding

JRTT provides low-interest, long-term funding, and technical assistance to contribute to the building of domestic passenger ships and cargo ships that correspond to policy issues.

### Policy Issues

#### Adapting to the environmental economy (Greening) in coastal shipping

- Promoting the diffusion of Super Eco-Ships (SES)
- Building Ships that Reduce the Burden on the Environment

#### Regional Development

- Building ships to sail routes to remote islands, etc.
- Building domestic cruise ships to meet tourism demand

#### Streamlining Logistics

- Promoting a modal shift

#### Employing crewmembers

- Promoting the planned employment of young crewmembers, female crewmembers, etc.
- Promoting the diffusion of ships with improved working environmentsdemand

#### Strengthening Business Foundations

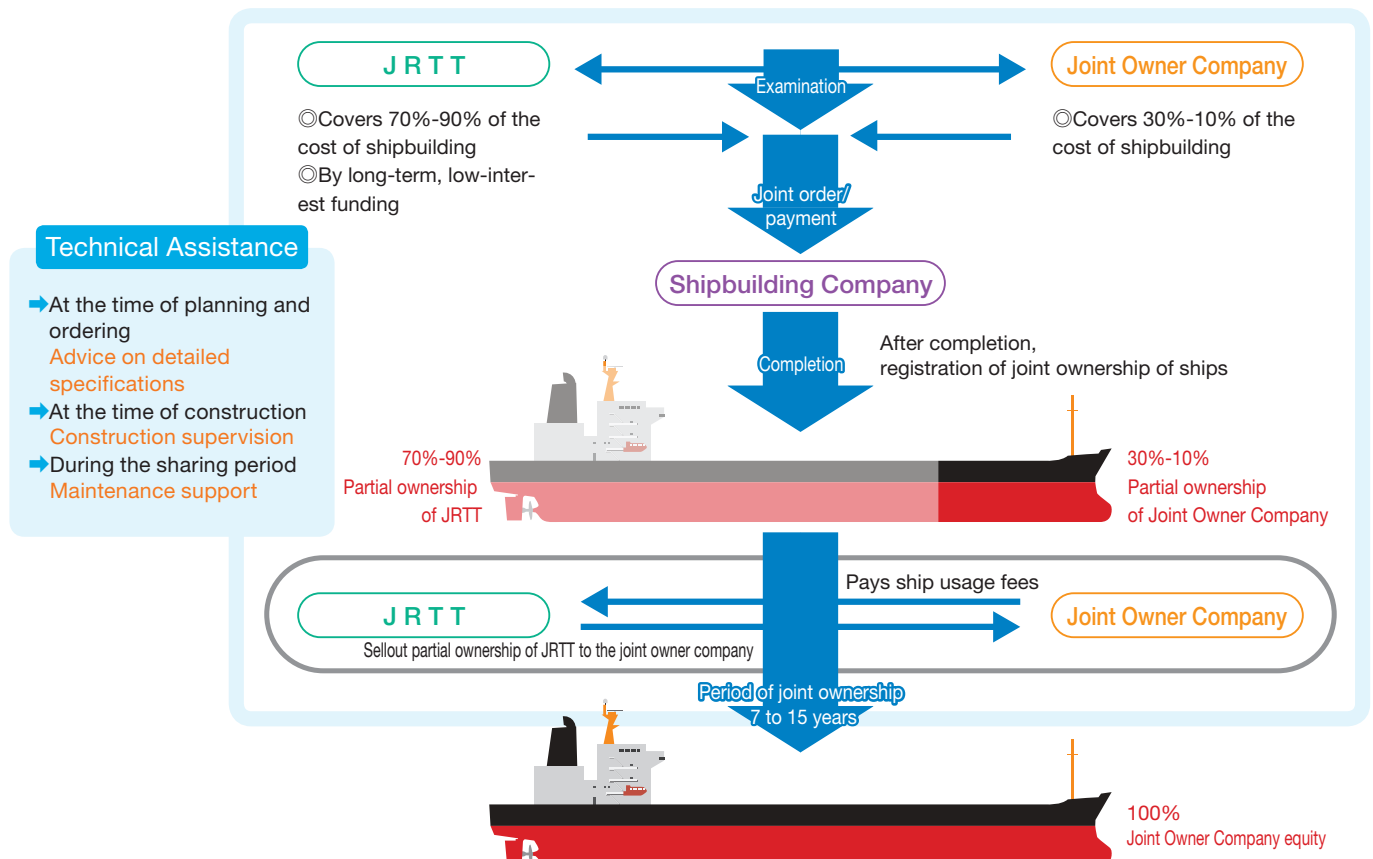
- Preparation of a stable, efficient business environment for coastal shipping companies

#### Reinvigoration/revitalization of maritime transport

- Maintaining routes by streamlining management, etc.

### Joint Ownership Shipbuilding Scheme

JRTT jointly builds ships in response to consultations and requests from shipping companies responsible for transporting passengers and cargo at sea. Building a ship requires plenty of funds. Therefore, as a partner of shipping companies, JRTT provides professional technical assistance, which is in addition to its advantageous financial cooperation.





## ● Shipbuilding Promotion Efforts

JRTT has been promoting the building of people- and environment-friendly ships, including those built for remote island routes, for many years. The company is also effective at contributing to Japan's socio-economic activities and people's lives surrounded by the sea. In recent years, coastal cruise ships corresponding Japan's inbound demand have been added as targets of JRTT's joint ownership shipbuilding scheme. JRTT is working to promote the shipbuilding by expanding the joint ownership shipbuilding scheme, which is in addition to a reduced interest rate for ships with improved working environments. All this is the aim of reducing crewmember workloads and improving their living environments.

### Promotion of the Shipbuilding for Routes to Remote Islands

Over the past 60-plus years, we have performed shipbuilding for some 600 ships for routes to remote islands, and the building of these ships, which are the only mode of transportation to and from remote islands, are contributing to the development of regional communities.



Tobishima, a 19G/T passenger ship employed on a route to remote islands between Imabari, Munakata, Oge, Kooge, and Okamura

### Promotion of Shipbuilding of Eco-friendly ships

We contribute to sustain and develop coastal shipping, which plays an extremely important role in Japan, through the building of ships that reduce carbon dioxide emissions and prevent marine pollution.



Kousho Maru, an environmentally friendly 7,297-G/T limestone ship

## ● Technical Assistance

### Dissemination of Excellent Ships through Technical Assistance from Planning to after Building

With engineers who have a wealth of know-how, data, and expertise from the building of some 4,000 ships, we provide technical assistance through all stages, from planning to design and shipbuilding, and continue technical assistance after completion to ensure efficient operation of the ships.



## Useful Technology for the Development of Coastal Ships

We are promoting the diffusion of technology that contributes to reduces environmental impact reduction and working environment improvements , and are working to build ships with barrier-free design and to solve problems in coastal shipping.

### Technological Studies

We collaborate with external experts, relevant companies, and others to conduct studies and research regarding the labor-saving, energy conservation, safety improvement, onboard working environment improvement, and other improvements required by coastal shipping companies, and provide the results of our studies to them as technical data.

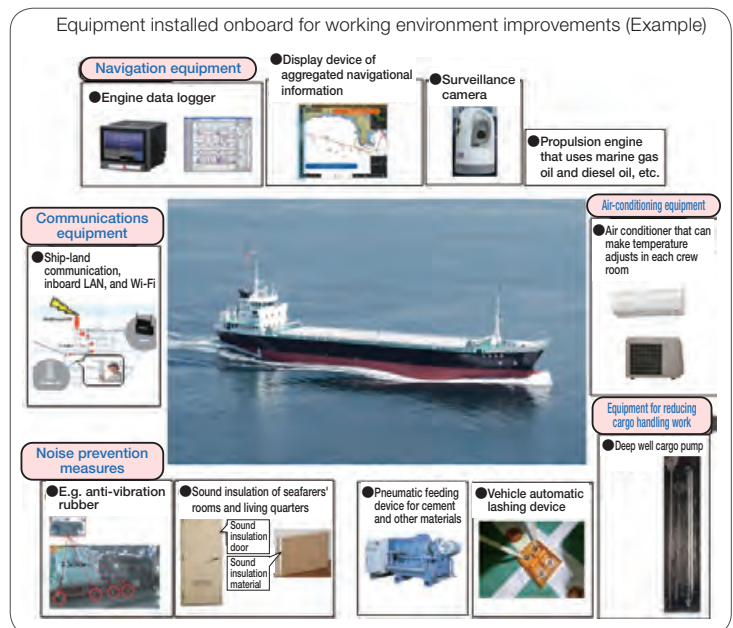
### Study on Technologies Contributing to Working Environment Improvements on Coastal Ships

Securing and training crew members continue to be a critical issue in coastal shipping in Japan. It is more important than ever before to introduce new technology to reduce workloads and improve productivity in order to promote the employment and retention of crewmembers through the creation of appealing workplaces.

Therefore, we conducted a study of available IoT-related technology for reducing workloads and improving productivity on coastal ships. The “Ships with Improved Working Environments” we created in FY 2018 reflect the results of this study. Based on our study results, we are promoting efforts toward laborsaving onboard using information and communications technology.

Ships with Improved Working Environments

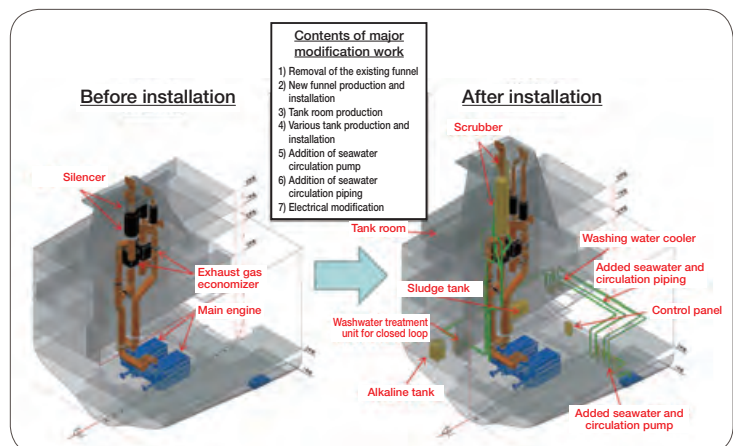
- Ships on which measures are taken to reduce crewmember workloads and improve their living environments



### Study on International Environmental Regulations (Global fuel sulphur limit of 0.50%)

To comply with the regulation capping the global fuel sulphur limit at 0.50%, which was enforced from January 1, 2020, ships need to take one of the following action: (1) to install a SOx scrubber (exhaust gas cleaning system), (2) to use compliant fuel oil, or (3) to utilize alternative fuels such as LNG.

For this reason, JRJT has started studies on the trial designing of scrubber-installed ships and the necessity of modifying onboard equipment when switching fuel oil ever used to compliant fuel oil in order to ensure smooth regulatory compliance in coastal shipping.



Study on Trial Designing of Hybrid Scrubber Installation on Existing Ships

### Providing Information Based on Technical Studies

We are providing information through seminars to diffuse and new technology for ships such as onboard IoT-related technology for ships. We also provide information based on technical studies through our website, which contains a handbook for -IoT -related technology, energy- and labor-saving equipment, design documents from studies on hull form, and an energy conservation manual for small, high-speed passenger ships, etc.



Scene from a seminar

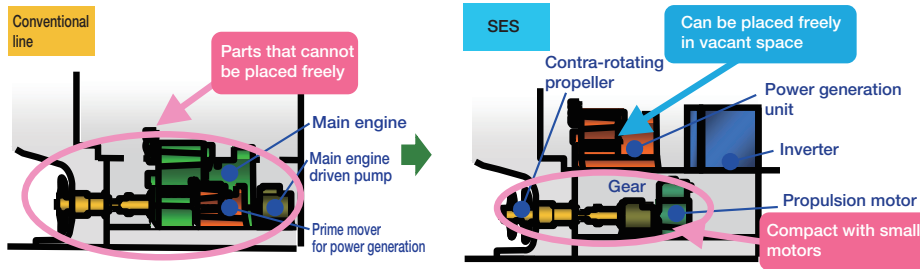


Technical information



## ● Super Eco-Ships (Electric Propulsion Ships)

We are working to popularize the Super Eco Ship (SES), which uses an electric propulsion system to reduce its environmental impact and improve logistics efficiency.



### Effects of SES Introduction

#### Comfort for Passengers and Crew

- Reduced vibrations and noise
- Reduced engine operation/maintenance work
- Labor saving in cargo handling and simplification of ship maneuvering

#### Eco-Friendly

→ CO<sub>2</sub> → NO<sub>x</sub> → SO<sub>x</sub> reduced

## ● Shipbuilding with Consideration of Barrier-free Design

To enable people having difficulty moving such as older people and, disabled people, and others to travel smoothly by public transportation, we are working to build passenger ships that comply with barrier-free design. Based on extensive experience and technical know-how, we provide technical assistance on barrier-free design, and promote building ships, which meet our technical standards developed for advanced barrier-free design beyond legal technical requirements.

### Comfortable Ship Equipment

The interiors of ships designed by JRJT are equipped with raising and lowering equipment used by wheelchair users and multifunctional (barrier-free) toilets with sufficient space ensured.



Stairlift: "Seven Islands Yui"



Multi-functional ostomate toilet: Salvia Maru



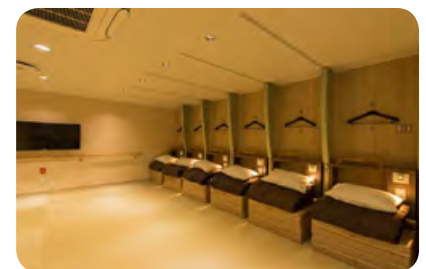
Barrier-free toilet: "SEA SPICA"

### Ensuring Sufficient Space

In building ships, we promote adopting barrier-free design for easy-to-use seating arrangements, sufficient space, etc. so that everyone can enjoy the voyage.



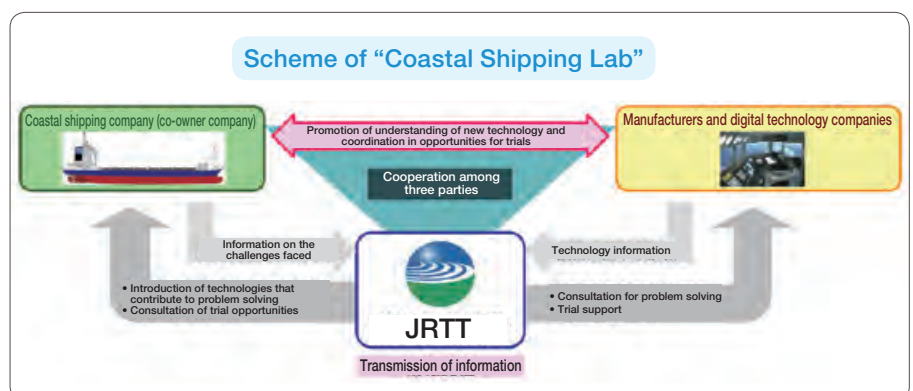
Barrier-free passenger rooms: "Takasu"



Barrier-free passenger rooms: "Sunflower Satsuma"

## ● "Coastal Shipping Lab", Serving as a Bridge for Technology to Solve Problems in Coastal Shipping

JRJT takes initiative to bridge the gap between companies with technology seeds and coastal shipping companies. We call this initiative "Coastal Shipping Lab". It intends to promote coastal shipping companies' understanding of new technology and create opportunities for trials to utilize it in order to solve coastal shipping companies' problems. Its initiatives include improvements in working environments, reduction in environmental impact, and an increase in safety improvement.



## Achievement of Shipbuilding

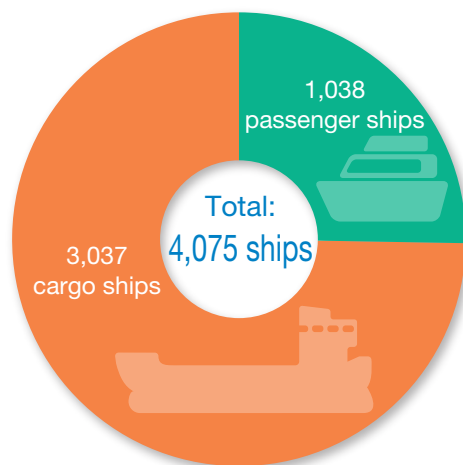
Through joint ownership shipbuilding of domestically operated passenger and cargo ships in coastal area, JRJT assists the national economy and people's lives in Japan.

### Major Achievement of JRJT's Shipbuilding Efforts

Over the 60-plus years since the establishment of the Coastal Passenger Liner Corporation —the predecessor to JRJT— in 1959, we have built a total of over 4,000 ships. As the largest shipowners in Japan—we own 264 cargo ships and 59 passenger ships as of March 31, 2020—we contribute to regional revitalization and the streamlining of logistics. Over that period, we have received many awards.

#### Total of Shipbuilding Efforts in JRJT

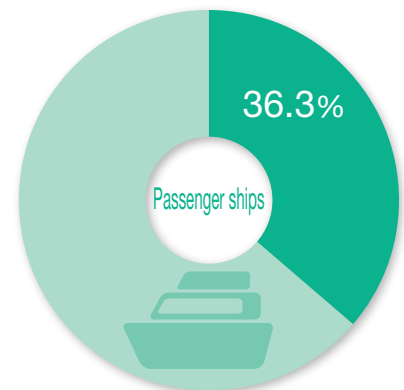
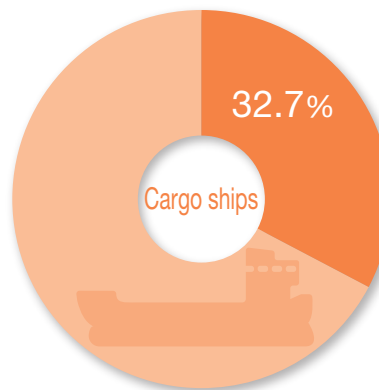
\*Completed ships from 1959-March 2020



#### Shipbuilding Share

Percentage of ships by the joint ownership shipbuilding scheme in use among new ships sailing within Japan (based on gross tonnage)

\*FY 2014-FY 2019 average



### JRJT's Cargo Ships



Choun Maru,  
a 396-G/T general cargo ship



Suzaku,  
a 749-G/T container ship



Sanko Maru,  
a 3,096-G/T oil tanker



Izumi Maru,  
a 13,038-G/T RORO ship



Meiyu Maru,  
a 5,589-G/T limestone ship



Asahi Ace,  
a 745-G/T liquefied petroleum gas carrier



## JRTT's Passenger Ships

### Ships for Routes to Remote Islands



Yuriya,  
a 273-G/T high-speed ferry that runs  
between Mishima and Hagi



Sioji,  
a 19-G/T passenger ship that  
runs between Mushima and  
Kasaoka

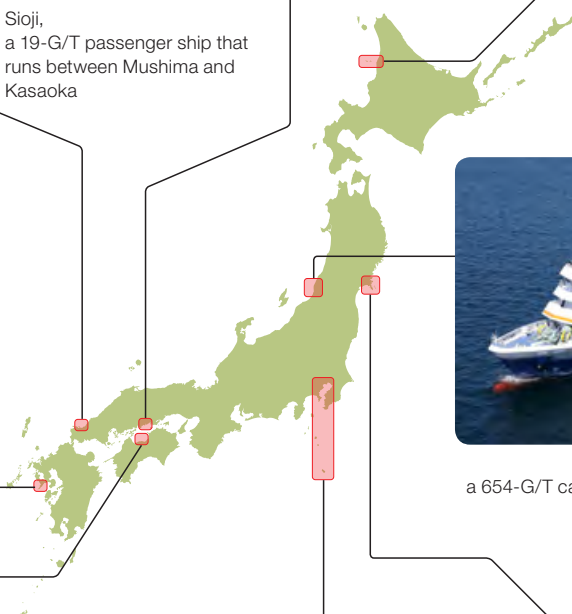


Sun Liner No. 2,  
a 122-G/T high-speed ferry  
that runs between Haboro,  
Yagishiri-island, and  
Teuri-island



Takasu,  
a 124-G/T high-speed ferry that runs  
between Takashima, Iojima, and Nagasaki

● Awards: Ship of the Year 2017, awarded in the  
small-sized passenger ship category



Ferry New Awashima,  
a 654-G/T car ferry that runs between Awashima  
and Iwafune



NEW IBUKI II, a 113-G/T passenger-cargo ship  
that runs between Ibuki and Kan-onji



Ogasawara Maru,  
an 11,035-G/T passenger-cargo ship that runs  
between Tokyo and Chichijima



Mermaid 2,  
a 113-G/T car ferry that runs between Ishinomaki  
and Ayukawa

### Long-Distance Ferries



Ferry Shimanto, a 12,636-G/T car ferry that runs  
between Tokyo, Tokushima, and Shin-Moji

● Awards: Ship of the Year 2016, awarded in the  
large-sized passenger ship category



Sunflower Satsuma, a 13,659-G/T car ferry that  
runs between Osaka and Shibushi

● Awards: Ship of the Year 2018, awarded in the  
large-sized passenger ship category

### Coastal Cruise ship



SEA SPICA,  
a 90-G/T high-speed ferry that runs between  
Hiroshima Ujina and Mihara

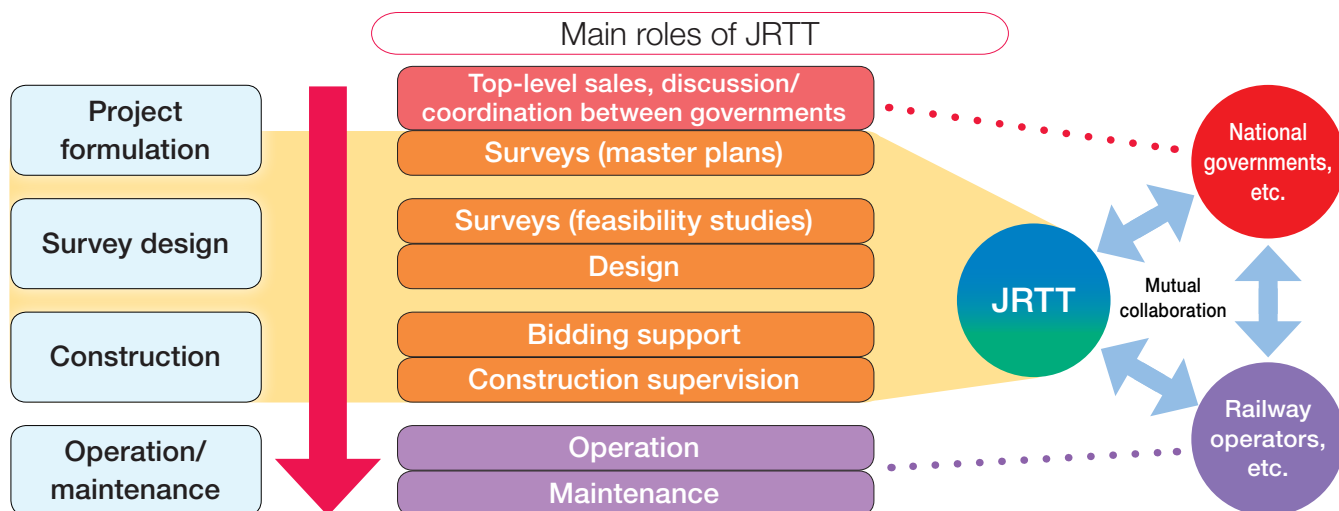
# Overseas Expansion Utilized Railway Technology

## ● Participation in Overseas High-Speed Rail Projects

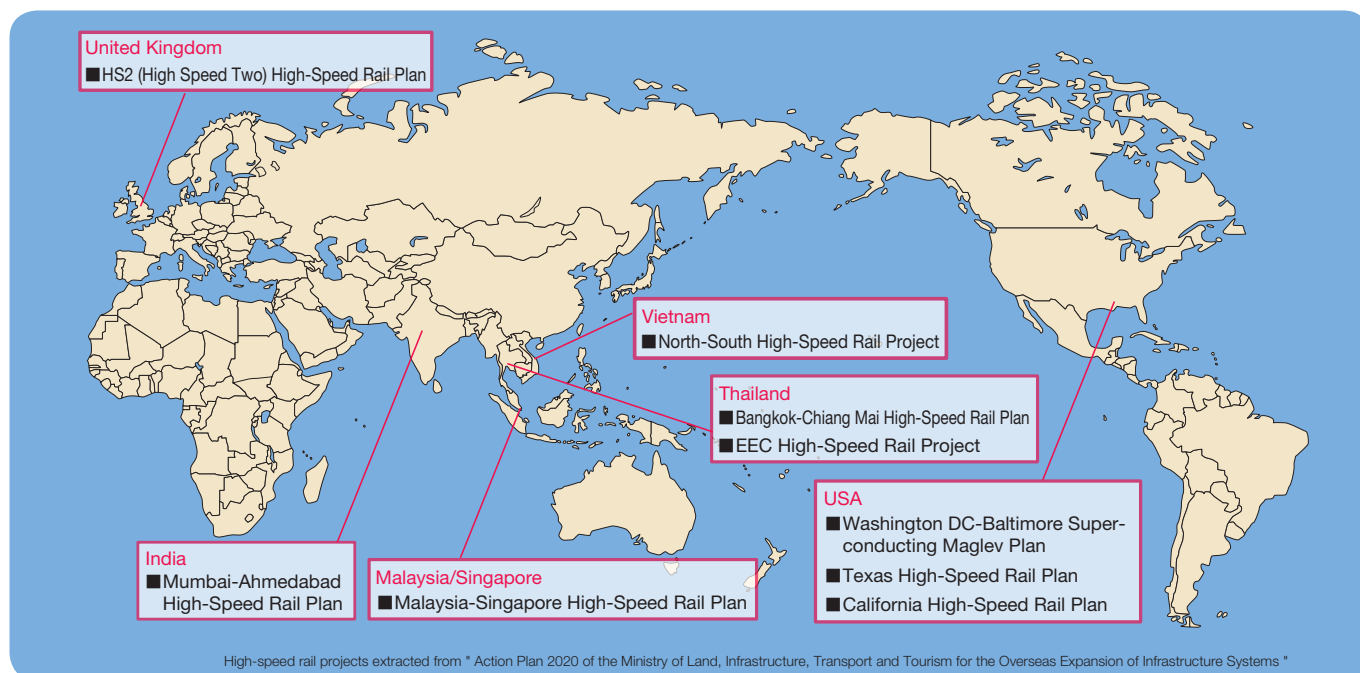
As global environmental issues have been recognized, the demand for public transportation has been increasing with economic growth in emerging countries in Asia and elsewhere. Therefore, expectations of railways have increased as an excellent mass transit system with a small environmental burden. Thus, many railway projects are being planned and studied throughout the world, and the railway market is expected to expand.

As the government of partner country has considerable influence with infrastructure development of their own, ability to cooperate and negotiate with them is crucial for smooth implementation of a project. JRJT as a public entity has advantages in this respect due to affluent experiences with railway technologies and expertise.

JRJT is expected to play a proactive role in high-speed railway projects overseas for its efforts in the construction of Shinkansen lines. To enable JRJT to participate in high-speed rail projects in other countries, the Japanese government enacted the Act on the Promotion of the Participation of Japanese Business in Overseas Infrastructure Projects in August 2018. With this act, we JRJT intend to make the best use of experiences and expertise we have cultivated through the construction of Shinkansen and other railway lines to date to help to build the future transportation networks in the world.



## Major High-Speed Rail Projects





## ● Overseas Technical Cooperation

Since 1964, JRJT has contributed to railway development all over the world by dispatching many railway experts based on requests from the Japanese government and others. To date, we have dispatched more than 2,000 experts to a total of 70 countries and regions. We have also accepted fellows and review missions from overseas and have introduced explained Japan's advanced railway technology to over 4,000 fellows and others from 100 countries and regions.

### Specific Efforts in Overseas Technical Cooperation

#### Taiwan High Speed Rail Project

The opening of the Taiwan High Speed Rail in 2007 is the first case of Japan's export of Shinkansen system. JRJT dispatched employees and cooperated with the project from the planning stages in 1989. Specifically, our cooperation started with the participation of JRJT engineers in the feasibility study during the investigation stage and continued into the bidding stage where we provided recommendations and proposals in technical terms. After the decision was made to introduce the Shinkansen system, we dispatched more engineers who specialized in the core systems of tracks and electricity as long-term experts and provided technical cooperation during the construction stage and for comprehensive testing prior to inauguration. We are confident that this project is a successful example of the export of the Japanese Shinkansen system which contains comprehensive railway construction technology and expertise accumulated amassed in Japan and put to work overseas from the planning stage until the line opened.



Technical cooperation for track/electrical system on the Taiwan High Speed Rail



A field survey for the high-speed rail in India

#### India High-Speed Rail Project

At the India-Japan Summit Dialogue in December 2015, the governments of India and Japan concluded a memorandum of understanding regarding the introduction of a Shinkansen system; the two governments decided that Japanese Shinkansen system would be provided to India's high-speed rail between Mumbai and Ahmedabad. JRJT has cooperated proactively with the project by dispatching railway experts since the feasibility study during the investigation stage. As the project progresses toward the opening of the line, our employees are on dispatch as comprehensive railway advisors to High Speed Rail Corporation of India Limited, the project entity. In Japan, we have accepted officers and engineers from India and given them tours of Shinkansen construction sites to help them further their understanding of safety in construction.

#### Technical Exchange with Sweden

As interest in high-speed rail grows in Sweden, the Ministry of Land, Infrastructure, Transport and Tourism of Japan and Swedish ministry of industry concluded a memorandum of understanding regarding cooperation in the railway sector. Based on this memorandum, JRJT has engaged in technical exchange regarding high-speed rail with the Swedish Transport Agency since 2013. The technical exchange involves efforts such as participating in working groups regarding high-speed rail and having our employees serve as lecturers at various seminars, and we introduce Japanese railway technology to Sweden while we learn about Swedish railway technology. We have also accepted officials from Sweden and have deepened our exchange through efforts such as tours of Shinkansen construction sites.



Railway sector technical exchange with Sweden

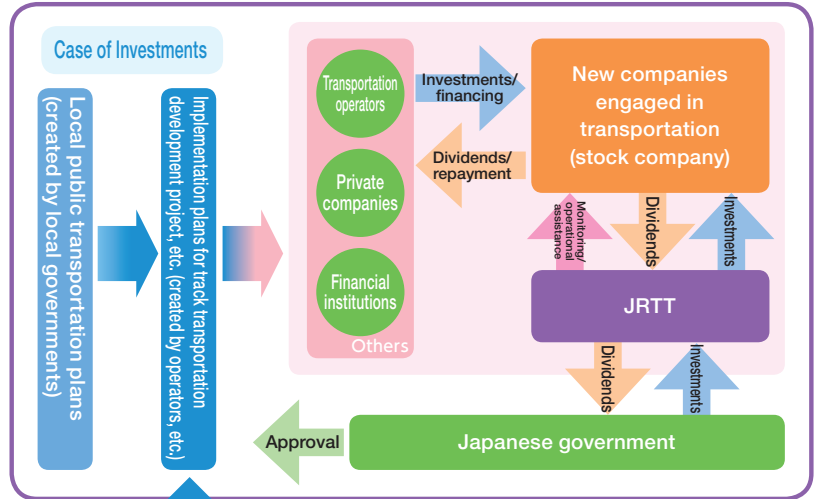
## Revitalization of Local Public Transportation, Etc.

We contribute to the revitalization of regional communities by providing funds to secure the provision of sustainable regional passenger transportation services, the development of railway facilities that enhance safety and convenience, and assist for a transportation infrastructure that connects urban.

### ● Revitalization and Rehabilitation of Local Public Transportation Through Investment and Financing

We invest in businesses that contribute to ensuring the sustainable provision of regional passenger transportation services, based on the Act on Revitalization and Rehabilitation of Local Public Transportation Systems.

Funding from JRJT enables more flexible fundraising for the initial investments that projects require and can be expected to attract necessary funding from local private companies, financial institutions, and others.



#### Bus Rapid Transit (BRT)

This is a bus system with high-order functions that enables speedy delivery, punctuality, and increased transportation capacity by combining articulated buses, the public transportation priority system (PTPS), bus routes, bus lanes, etc.



#### Examples of Projects to Promote



#### Light Rail Transit (LRT)

This next-generation track-based transportation system has excellent features, such as ease of getting on and off, punctuality, speedy delivery, and comfort, utilizing light rail vehicles (LRV) and improved tracks and tram stops.

### ● Lending of Funds for Urban Railway Development

To enhance urban railway networks that contribute to reinforced access to international airports and further convenience, we are lending funds to develop urban railways.



Example of Urban Railway



Example of Logistics Base

### ● Lending of Funds for the Efficiency of Logistics Operations

**Certified Logistics Base Facilities (e.g., Truck Terminals) are based on the Act on Promotion of Integration and Rationalization of the Logistics Services.**

We lend funds to the development of logistics base facilities of a certain scale that have the functions of connecting trunk transportation with urban transportation, as well as connecting multiple transportation modes, such as land transportation and marine transportation.

### ● Lending of Funds for Constructing the Linear Chuo Shinkansen

To assist the full opening of the Linear Chuo Shinkansen, we took on a low-interest loan from the Fiscal Loan Fund and provided a long-term, fixed, low-interest loan for a portion of construction expenses to JR Central, the entity of construction.



Yamanashi Maglev Test Line (JR Central)



## ● Subsidy for Railway Infrastructure Development

Since the establishment of the Railway Development Fund (RDF)—the predecessor to JRTT—in 1991, JRTT has provided assistance for railway companies in Japan for the construction of subway lines, new town railway lines and airport access lines, the streamlining of JR lines and other railway lines, improvements to the railway infrastructure of regional railway companies, and more.

### Community Rails

JRTT is subsidizing the development of railway facilities. Its activities include the establishment of new stations to improve the convenience of railways in response to transportation needs, based on plans formulated by legal councils established by municipalities, etc.



Construction of Shin-Taro Station (Sanriku Railway)

### Comprehensive Improvements in Railway Stations

JRTT provides assistance contributing to station improvements, such as the widening of the platforms and sophistication of station space, including barrier-free facilities, life support functional facilities, and tourist information facilities.



Improvements in Ikegami Station (Tokyu Corporation)

### Construction/Improvement of Urban Railways

JRTT provides assistance in new construction and improvement projects for urban railways, such as the construction of new subway lines and the development of connecting lines that make effective use of existing urban railway facilities for improvements in prompt accessibility.



Extension of the Nanakuma Line (Fukuoka Municipal Transportation Bureau)

### Comprehensive Safety Measures for Railway Facilities

JRTT provides assistance in maintaining equipment for safe and stable transportation services and railroad crossing security equipment for railroad crossing safety measures, as well as technological development in the railway field.



Railway Disaster Prevention [Shore Protection] (JR Hokkaido)

## JNR Settlement Administration

JRTT's JNR Settlement Administration includes the liquidation of assets, such as land inherited from the former Japanese National Railways (JNR). JRTT bears expenses required for assistance for each JR company's full privatization promotion, payment for pensions to former JNR employees, and compensation for work accidents while JNR were in operation.

## ● Full Privatization Promotion and Assistance for JR Companies

We provide financing and other assistance to each JR companies—JR Hokkaido, JR Shikoku, and JR Freight to help them update outdated railway infrastructure, improve railway infrastructure to improve their business foundations, and more.

A 261-5000 series DMU for limited express railcar (JR Hokkaido)



## Environmental Efforts

We are working to improve the environment-friendly transportation system in order to protect the rich and beautiful earth.

### Basic Environmental Policy

To describe our approaches and philosophies regarding environmental considerations in conducting business, we have set out the “Basic Environmental Policy” to drive our efforts to reduce environmental burdens.

#### Basic Environmental Policy

JRTT’s mission is to provide smooth land and maritime transport, thereby contributing to the healthy development of the national economy and improving the lifestyles of Japanese people. To fulfill this mission, JRTT strives to contribute to society by proactively engaging in efforts to conserve the global environment and creating a transportation network for the future that seamlessly coexists with the abundant and beautiful natural environment.

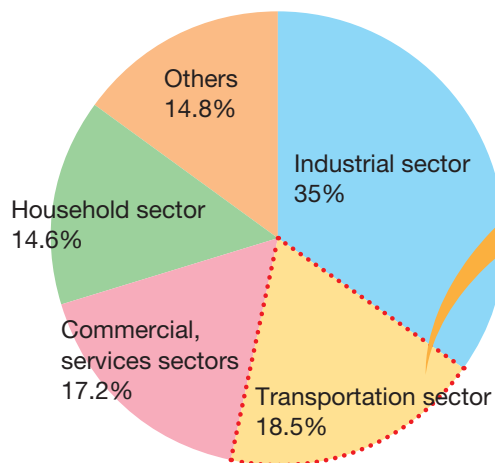
1. We strive to reduce the environmental burden created in all areas of our business activity, including railway construction, to promote improvements in transportation infrastructure by railway companies, maritime transport companies, and others, and other support.
2. We observe laws and regulations regarding environmental conservation as well as self-imposed standards.
3. We contribute to regional communities by actively participating in local environmental conservation activities.

### Making Eco-Friendly Transportation Systems

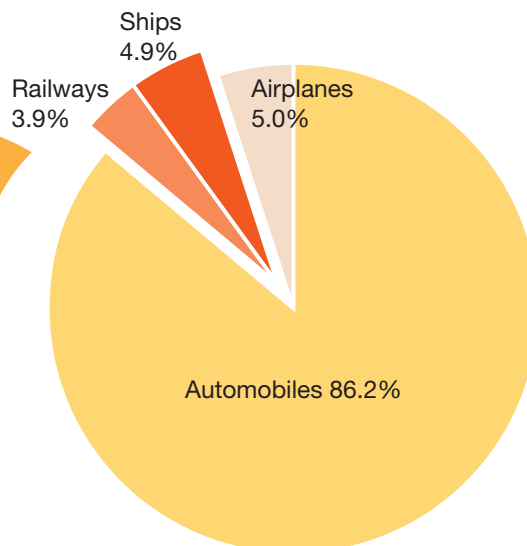
Carbon dioxide accounts for most of the greenhouse gases that cause global warming. The transportation sector accounted for roughly 20% of carbon dioxide emissions in Japan.

While automobiles account for 86.2% of carbon dioxide emissions in the transportation sector, ships and railway account for 4.9% and 3.9%, respectively.

Ratios of Carbon Dioxide Emissions in Japan by Sector



Transportation sector



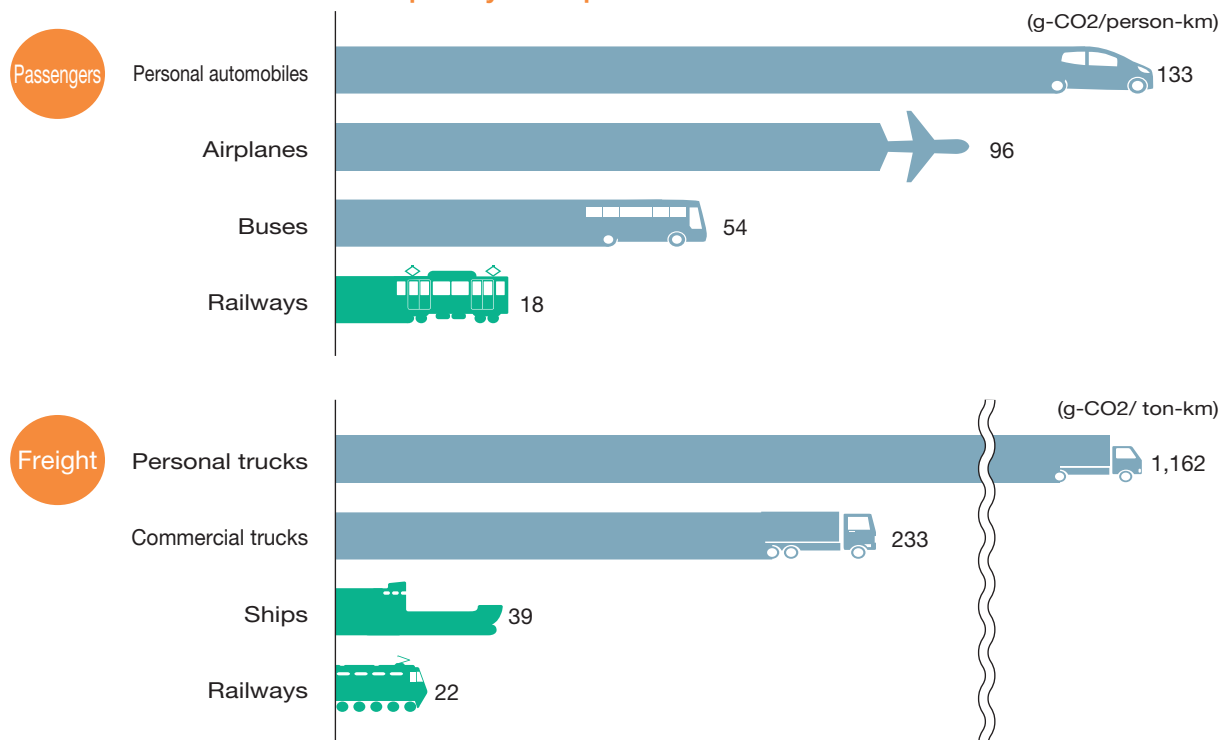
Created from data of the MLIT (Ministry of Land, Infrastructure, Transport and Tourism)



In addition, since railways and ships are high-volume modes of transportation, a large number of people and things can be carried on each trip and voyage. Passenger railways emit 1/7 the carbon dioxide per person-kilometer of personal automobiles, and freight railways emit 1/10 the carbon dioxide per ton-kilometer of commercial trucks, while ships emit 1/6 that amount.

In light of these facts, railway and ships are more energy efficient and eco-friendly than other modes of transportation. JRTT steadily constructs railways and builds ships in an effort to contribute to the establishment of an eco-friendly transportation system with low carbon dioxide emissions.

### Carbon Dioxide Emissions in Japan by Transportation Volume



Created from data of the MLIT (Ministry of Land, Infrastructure, Transport and Tourism)

## Sharing Environmental Information and Social Contribution Activities

To further understand the establishment of eco-friendly transportation systems and to create partnerships with regional communities, we cooperate with local environmental conservation activities by participating in related events, hosting site tours, holding technical seminars about coastal shipping, and more.



A technical seminar about coastal shipping

## Issuance of Environmental Report

To share our basic principles toward environmental conservation and efforts regarding the environmental sector with as many people as possible, JRTT prepares an annual "Environmental Report" in accordance with the Act on the Promotion of Business Activities with Environmental Consideration by Specified Corporations, etc., by Facilitating Access to Environmental Information, and Other Measures.

We invite you to visit our website for more information.



# Efforts to Reduce Environmental Burdens

JRTT implements environmental considerations and works to reduce environmental burdens while performing construction, improvement, and other work. Here, we explain some prominent examples of these efforts.

## Eco-Friendly Railway Construction

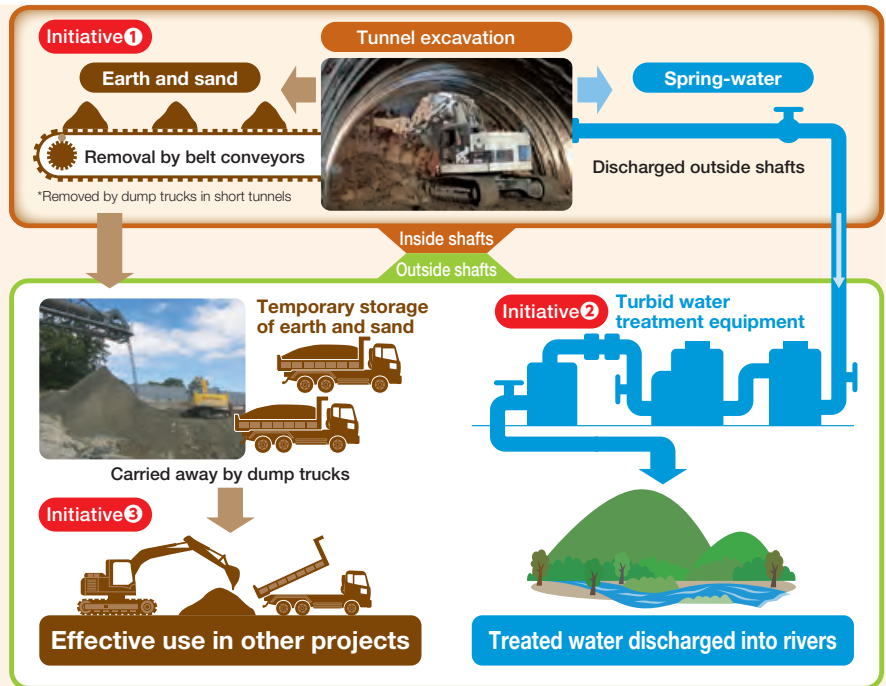
### Example of Efforts in Tunnel Construction



Earth and sand removal by belt conveyor inside a shaft



Use of soil generated by construction in a park development project



### Initiative 1 Removal of Excavated Earth by Belt Conveyors

Earth and sand generated by excavation in tunnel construction are generally carried out of shafts and stored at a temporary location on site, and then carried away by dump trucks or other heavy machinery. However, we used belt conveyors to carry away earth and sand in Tunnels on the Hokkaido Shinkansen between Shin-Hakodate-Hokuto and Sapporo, and so on. We employed this method in an effort to contribute to global warming countermeasures by reducing the carbon dioxide emitted by dump trucks and heavy machinery when carrying away earth and sand and improving the working environment inside the tunnels by improving the safety of the work and reducing emissions and dust. We intend to continue using belt conveyors in the construction of long tunnels in an effort to reduce carbon dioxide emissions.

### Initiative 2 Treatment of Wastewater Resulting from Tunnel Construction

Groundwater from the ground around tunnels becomes mixed with excavated earth and sand during tunnel construction. As an environmental conservation measure, we use turbid water treatment equipment that satisfies wastewater standards to treat the water before discharging it into rivers and the like.



Turbid water treatment equipment

### Initiative 3 Use of Soil Generated by Construction in Other Projects

We make proactive efforts to effectively use soil generated by tunnel excavation and other construction as embankment material in other areas as well as to provide it as embankment or fill dirt for other public projects (reclamation projects, residential land development, station area improvement projects, etc.).

## Promotion of Shipbuilding to Environmental Conservation

We promote the building of Super Eco-Ships (SES), low-emission ships (advanced low-carbon dioxide emission ships, high-performance low-carbon dioxide emission ships), and other ships contributing to the greening of coastal shipping.



Salvia Maru, an SES ferry that runs between Tokyo, Ohshima, and Kozushima



# Contribution to SDGs

JRTT contributes to the UN Sustainable Development Goals (SDGs) by developing the transportation network responsible for tomorrow.

## Contribution to the UN Sustainable Development Goals (SDGs)

### SUSTAINABLE DEVELOPMENT GOALS

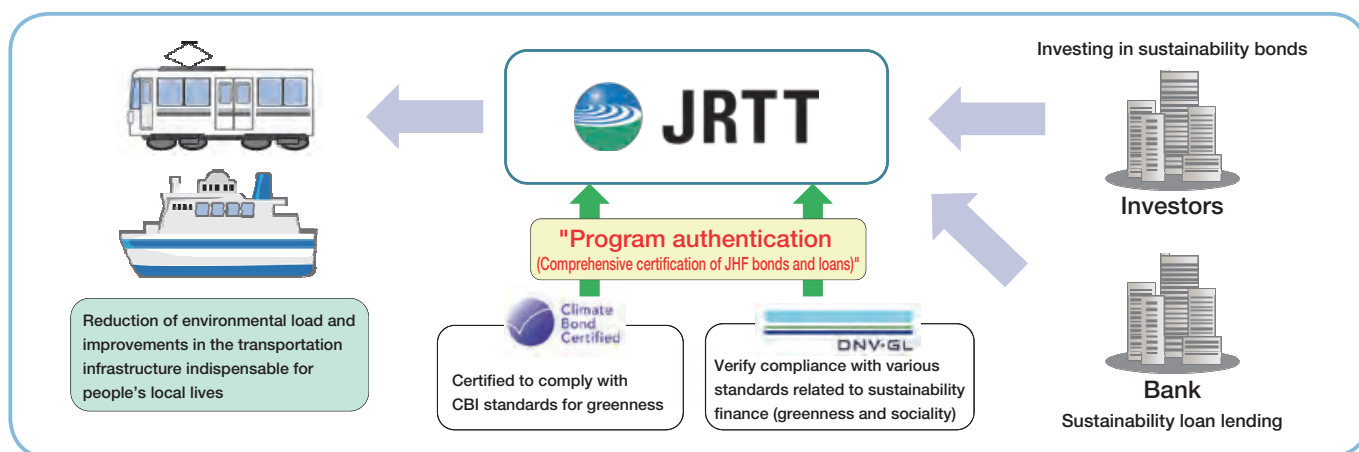
JRTT contributes to achieving the SDGs goals by developing sustainable and resilient transportation infrastructure and the development of environmentally friendly transportation systems.

- Development of transportation network
- Promotion of modal shift
- Provision of safe and comfortable services that comply with the Barrier-Free Act.
- Development of an environment-friendly transportation system
- Prevention measures for marine pollution, etc.

## Fundraising by Sustainability Finance

Sustainability finance has both effects of (1) environmental improvements (greenness) and (2) contribution to solving social issues (social nature). JRTT was verified by an international third-party evaluation agency for sustainability finance (bonds and market borrowing) in January 2019. As for the environmental improvement effect, JRTT has been the first organization that acquired program certification from the Climate Bonds Initiative (CBI), an international NGO that promotes large-scale investment for a low-carbon economy with strict standards. The program certification is a one-time certification that enables continuous financing.

With the funds raised through sustainability finance, JRTT will contribute to the achievement of the UN Sustainable Development Goals (SDGs) by reducing environmental impact and improving transportation infrastructure that is indispensable for local life. Simultaneously, JRTT will promote domestic ESG investments (i.e., investments that focus on and select companies that consider the environment, society, and governance).



Scheme of sustainability finance

## Development of Environment-friendly Railways

The Shinkansen, as well as other railways, is a means of transportation with low carbon dioxide emissions and extremely high transportation efficiency. JRTT is promoting the use of environment-friendly railways through the development of railways.

Sotetsu-JR Through Line  
JR Line Junction at Hazawa Yokohama-Kokudai Station



## Initiatives for Society

### Efforts for Site Tours

JRTT offers valuable tour opportunities that can only be experienced at construction sites of railway facilities during the project periods. These on-site opportunities will enable children, who are the leaders of the future society, to learn about railways as transportation infrastructure important for community development and familiarize people with railway operations.



Rail walk in the track laying section



Site tour in the tunnel construction area



Site tour in the viaduct construction area



Site tour at the time of entering the test run

### Interaction with Local Communities

We take every opportunity, such as exhibits at events held in each region and lectures, and have more people know about JRTT's activities and interact with the general public.



Events in each region



Railway Festival

### Railway Landscape Photography Contest

Every year, October 14 is Railway Day, which commemorates the first railway opening in Japan. JRTT celebrates the development of railways, hoping that a wide range of people will fall in love with railways and that people's interest in railways' role will increase.

JRTT co-sponsors the photo contest with the Railway Day Executive Committee on the theme of railway scenery with the colorful four seasons of Japan. The company also supports the purpose and raises people's awareness of the role of railways.



Exhibition of Contest-winning Works and Competitive Works

### Support for Raising Next-Generation, and Women's Participation and Advancement

In the procedures of placing construction and other work orders, JRTT fully adopts a bidding system that evaluates companies and to what extent they are working to nurture the next generation or promote women's active participation.

Furthermore, JRTT received a certification "Kurumin Mark" from the Minister of Health, Labor, and Welfare, which is awarded to companies that support child-rearing, under the Act on Advancement of Measures to Support Raising Next-Generation Children.





## Overview

JR TT is an incorporated administrative agency (an Agency Managed under the Medium-term Objectives) established in 2003 by the merging of the Japan Railway Construction Public Corporation and the Corporation for Advanced Transport & Technology.

**Name** Japan Railway Construction, Transport and Technology Agency

**Name in Japanese** 独立行政法人 鉄道建設・運輸施設整備支援機構

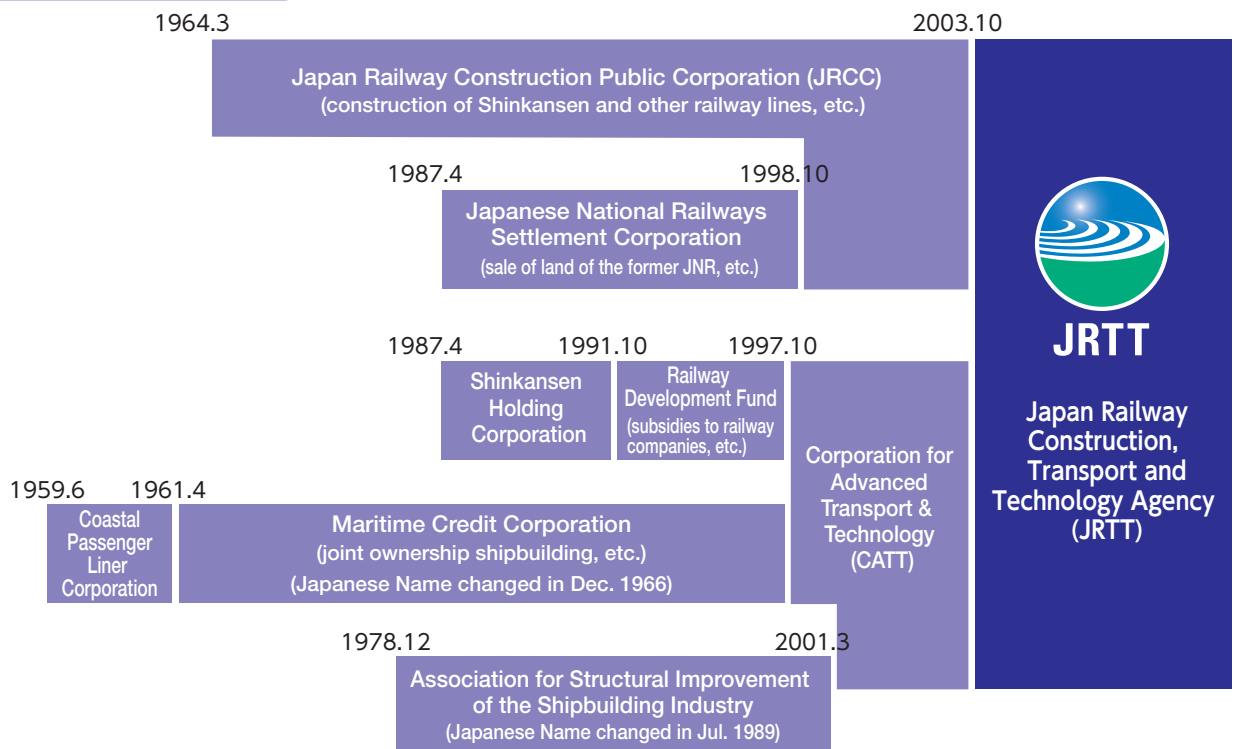
**Abbreviated name** JR TT

**Established** October 1, 2003

### Purpose

To establish a transportation system based on modes of mass transportation by constructing railways, and providing assistance for promoting the development of railway infrastructure by railway companies, shipping companies, and others, and other assistance.

## Corporate History



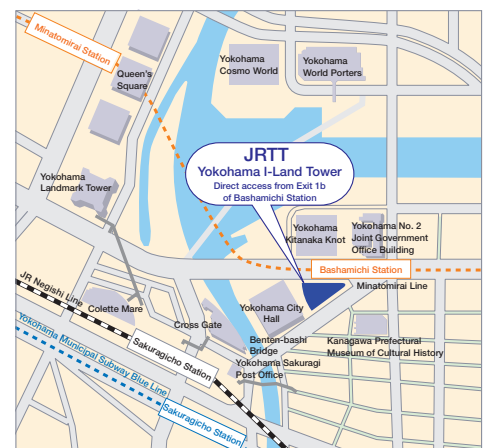
## Address

● **Headquarters:**  
Yokohama I-Land Tower  
6-50-1 Honcho, Naka-ku, Yokohama-City, Kanagawa, 231-8315 Japan

● Direct access from Exit 1b at Bashamichi Station on the Minatomirai Line

● 5-minute walk from Sakuragicho Station on the JR Lines/Yokohama Municipal Subway Blue Line

■ In addition to the head office, JR TT has local branch bureaus in charge of railway construction to carry out operations.





**Japan Railway Construction, Transport and Technology Agency**

[www.jrtt.go.jp](http://www.jrtt.go.jp)

Contact

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