Toward the Future of the Transportation Networks
- Corporate Profile -

JRTT

Japan Railway Construction, Transport and Technology Agency

JRTT Assists

Shinkansen bullet trains substantially shorten travel times and encourage the revitalization of regional economies. Urban railways uphold our cities and make them more appealing. Coastal shipping supports lifestyles and industry by safely transporting people and supplies. Each of these transportation infrastructure components are vital toward ensuring continued convenience for society.

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

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 in the time 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 using financial resources such as the rail access charge after construction has finished 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).

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 distribution of goods 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 ship-owners are small and medium-sized companies. Nonetheless, they must take action in response to changes in the business atmosphere such as restructuring of the shipping industry, business trends, the intensification of safety regulations and other legislation, and technological innovations. To enable shipping operators 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 support 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 construction of ships with facilities that improve working environments, ships that facilitate modal shifts, ships that contribute to carbon dioxide reduction, and others.



Railways and Coastal Shipping

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.

It is JRTT's (Japan Railway Construction, Transport and Technology Agency) role to provide assistance in the construction and improvement of this infrastructure and these facilities.

JRTT Assists Urban and Regional Railways

JRTT has assisted third-sector and other railway operators that lack sufficient technical capacity, and constructed 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 also 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.

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 to railway operators working on facility upgrades to improve railway networks and further improve convenience.

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

JRTT Assists Global 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 Promotion of the Participation of Japanese Business in Overseas Infrastructure Projects legislation 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 partner with private companies to promote the development of high-speed rail systems globally.

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.

Japan **R**ailway Construction, **T**ransport and **T**echnology Agency

JRTT's Basic Philosophy

Contribute to Build Tomorrow's Transportation Networks.

- We contribute to build 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.

JRTT's 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.

Symbol

Logotype

JRTT

Symbol & Logotype

This symbol expresses the functions of JRTT, and represents the future we will achieve by pooling our efforts and growing. Green represents the land, and blue represents the ocean. Together, the colors symbolize our consideration of the global environment. The JRTT logotype signifies our reliable presence in the transportation industry and the public's trust in our assistance in public infrastructure.

*The symbol is a registered trademark of JRTT (Registration No. 4857757)

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Continuing the Construction of Shinkansen Lines

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.

JRTT retains ownership of the infrastructure after construction, and lends it to each of the JR companies, which operate and manage the lines.

Kyushu Shinkansen between Takeo-Onsen and Nagasaki

[66km]

We began construction on this section with completion scheduled for around 10 years after the government approval.
In January 2015, the national government and ruling parties agreed to complete construction as much ahead of schedule as possible with help from the strongest efforts of local governments along the line.

Hakamano Bridge in Saga Prefecture

Hokuriku Shinkansen between Kanazawa and Tsuruga

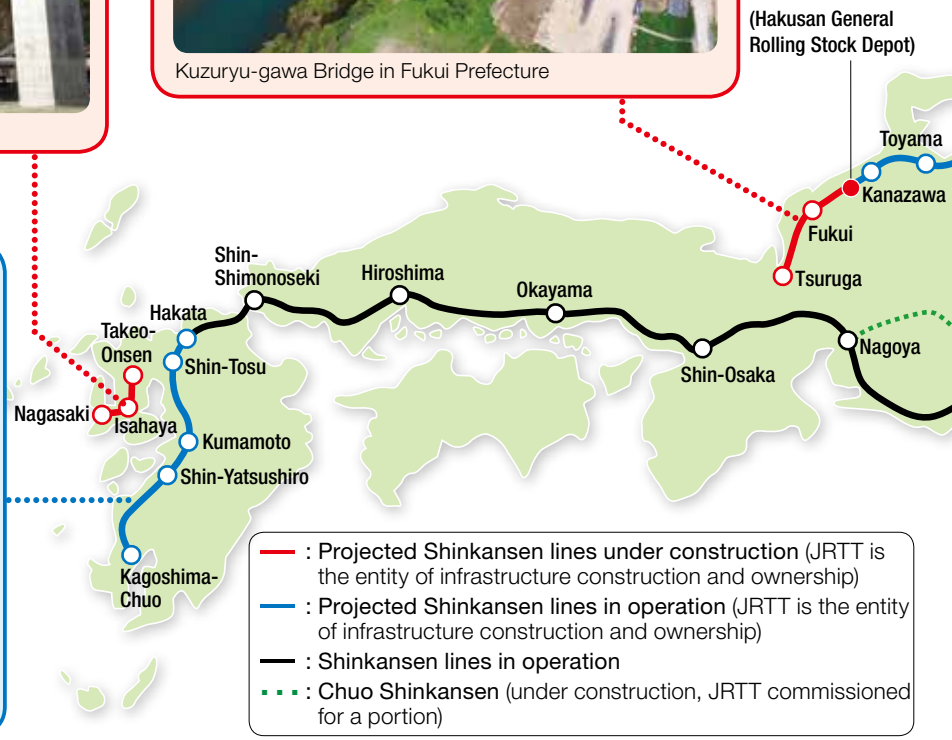
[125km]

We began construction on this section with completion scheduled for around 10 years or a little longer after the opening of the section between Nagano and Kanazawa Stations. We are continuing construction work with plans to complete it by the end of FY 2022.

Kuzuryu-gawa Bridge in Fukui Prefecture

Kyushu Shinkansen between Hakata and Kagoshima-Chuo

[257km]



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

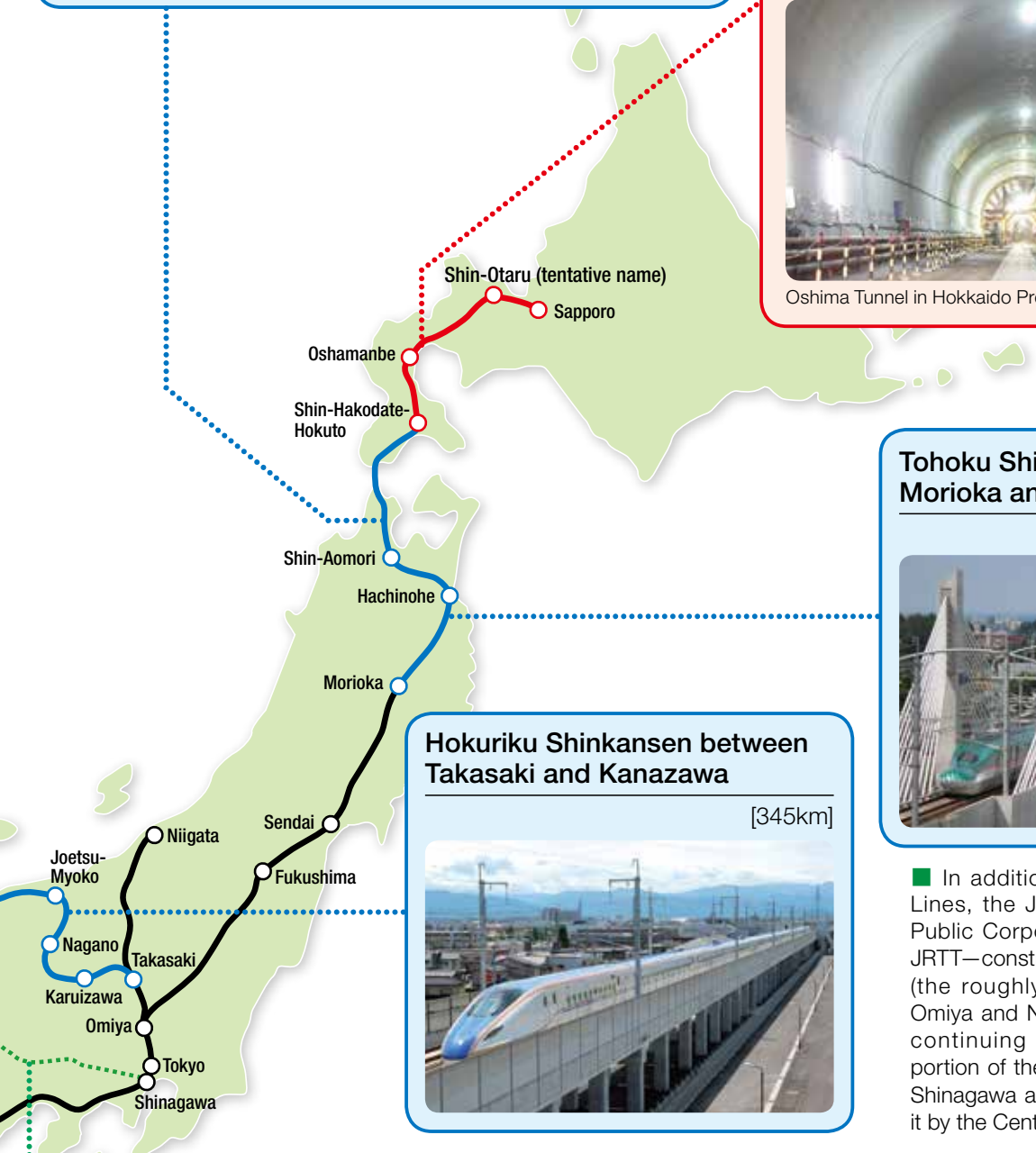
[149km]

Hokkaido Shinkansen between Shin-Hakodate-Hokuto and Sapporo

[211km]

We began construction on this section with completion scheduled for 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 construction by FY 2030, five years earlier than scheduled, with help from the strongest efforts of local governments along the line.

Oshima Tunnel in Hokkaido Prefecture



Tohoku Shinkansen between Morioka and Shin-Aomori

[178km]

Hokuriku Shinkansen between Takasaki and Kanazawa

[345km]

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

Financing for the Expense of 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 the entity of construction, Central Japan Railway Company.

Photo provided by Central Japan Railway Company

Improvement of Urban 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 company 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.

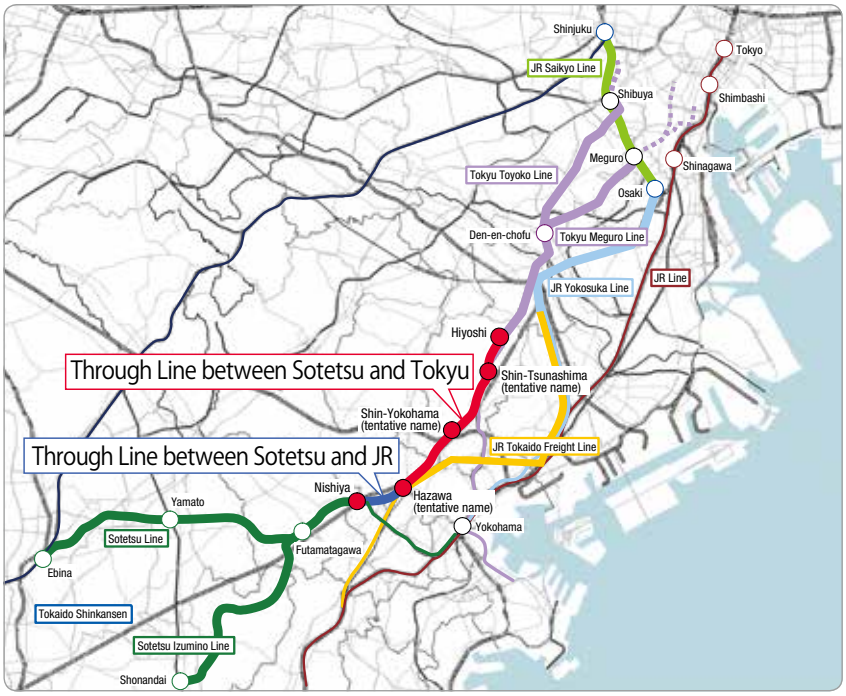
Eastern Kanagawa Lines (The Through Lines between Sotetsu and JR/Sotetsu and Tokyu)

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 JRTT is proceeding with the construction as the entity of construction. The through line between Sotetsu and JR connects Nishiya Station on the Sotetsu Line to the area near Yokohama-Hazawa Freight Station on the JR Tokaido Freight Line, and the through line between Sotetsu and Tokyu connects Hazawa Station (tentative name) to Hiyoshi Station on the Tokyu Line.

Sagami Railway Company is the entity of operation for the through line between Sotetsu and JR. The entities of operation for the through line between Sotetsu and Tokyu are Sagami Railway Company and the Tokyu Corporation.

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

Nishiya Tunnel on the Through Line between Sotetsu and JR



Line Map for the Through Line between Sotetsu and JR / the Through Line between Sotetsu and Tokyu

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

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

Development and Improvement for Urban Railways, Regional Railways, etc.

Since 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.

New Construction/Improvement of Urban Railways

We provide assistance for new construction and improvement projects on urban railways, from constructing new subway lines to improving connection lines through the effective use of existing urban railway infrastructure and other efforts to improve promptness, converting freight railways into passenger railways and more.

Subway construction (Sendai Subway Tozai Line)
Photo provided by the Sendai City Transportation Bureau

Conversion of freight railway to passenger railway
(Osaka Soto-Kanjo Railway Osaka Higashi Line)

Comprehensive Improvement of Railway Stations

We provide assistance for creating universally accessible stations, improving railway station spaces that provide lifestyle support functions, and the comprehensive improvement of railway stations that are integrated into community building projects.

Koshien Station (Hanshin Electric Railway Company)

Transitions to Community Rail

We provide assistance for the establishment of new stations and the construction of new platforms and other railway infrastructure improvements for improving convenience for railway passengers in response to transportation needs based on spatial strategies developed by legally mandated councils established by municipal governments.

Extension of the Kabe Line (West Japan Railway Company) in Hiroshima Prefecture

Upgrading Outdated Infrastructure, etc.

We provide financing and other support to Hokkaido Railway Company, Shikoku Railway Company and Japan Freight Railway Company to help them update outdated railway infrastructure, improve railway infrastructure to improve their business foundations, and more.

A new 261 series diesel rail car for
Hokkaido Railway Company

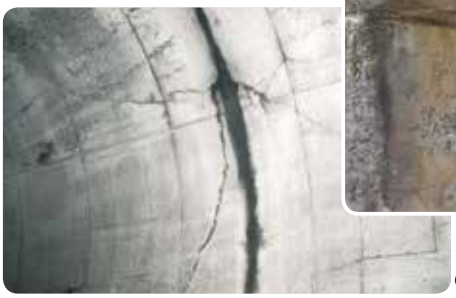
A new EH800 model locomotive for
Japan Freight Railway Company
(A locomotive designed specifically to run in the Seikan Tunnel sharing it with the Hokkaido Shinkansen)

Technical Assistance for Railway Infrastructure

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.

A field survey in progress



Cracks inside a tunnel

Disaster Restoration and Disaster Prevention Measures

JRTT provides assistance for disaster recovery and undertakes disaster prevention measures.

Disaster Restoration Work after the Great East Japan Earthquake

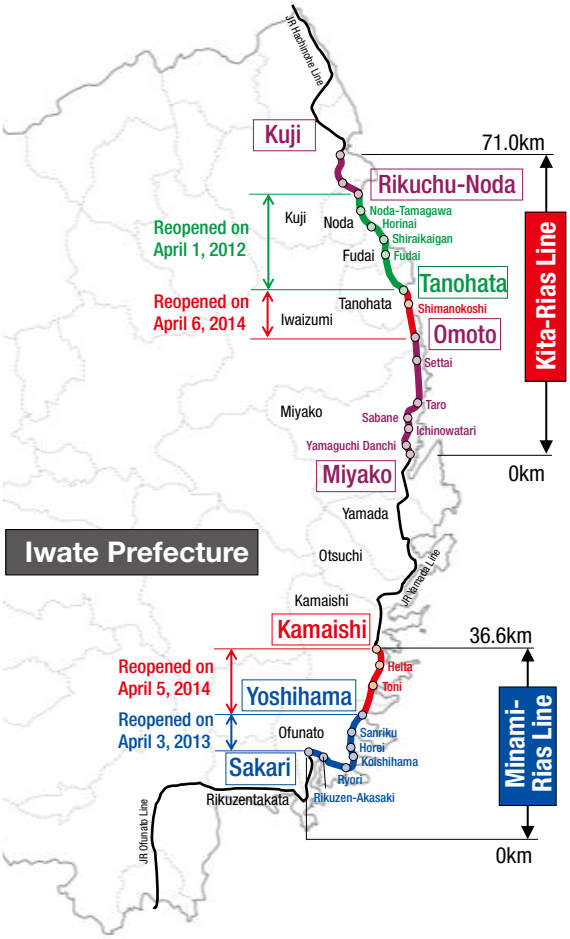
Sanriku Railway Lines Restoration Work

Entrustor: Sanriku Railway Company
Commissioned 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, mechanical and electrical engineering in the commissioned work sections
Period of work: November 1, 2011 to September 30, 2014

The enormous tsunami waves generated by the Great East Japan Earthquake on March 11, 2011 caused destructive damage to the Sanriku Railway lines. On November 1, 2011, Sanriku Railway Company entrusted JRTT to perform restoration work.

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)

Sendai Airport Access Line Restoration Work

JRTT was commissioned to construct the Sendai Airport Access Line, which 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.

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 such as sending out an advance team to conduct field surveys immediately after the earthquake, to accepting two workers from Sendai Airport Transit Company in April 2011 to investigate proposals for restoration measures, manage restoration work, and survey the health of existing structures.

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.

●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)

Local Children Leading a Departure Ceremony
(Sendai Airport Station)

Safety Measures and Disaster Prevention Measures

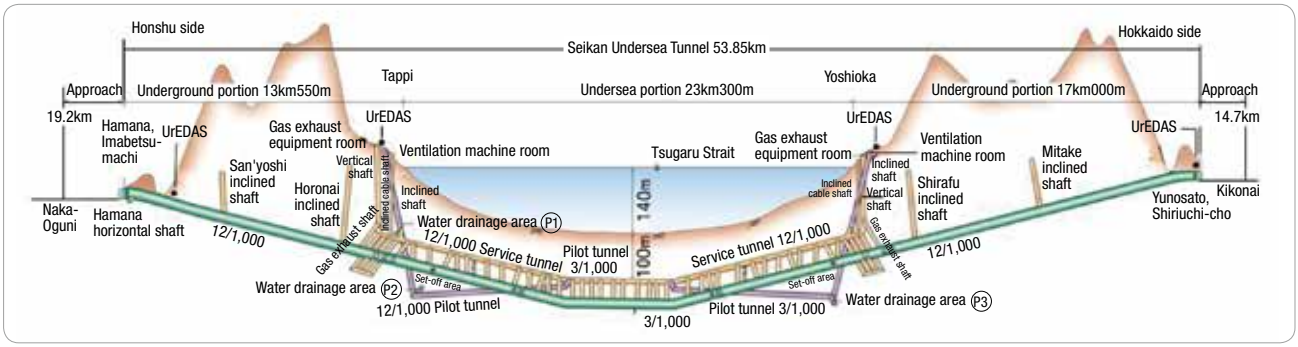
Assistance for Coastline Preservation Measures, Rockfall/Avalanche Prevention, etc.

To help preserve and protect neighboring residences, roads and farmland, we provide assistance for improving railway infrastructure to prevent rockfall and avalanches, preserve coastlines and the like.

Railway disaster prevention work: Rockfall prevention measures
(Kyushu Railway Company)

Preserving the Seikan Undersea Tunnel

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



Schematic Diagram of the Seikan Undersea Tunnel

Achievement of Construction

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

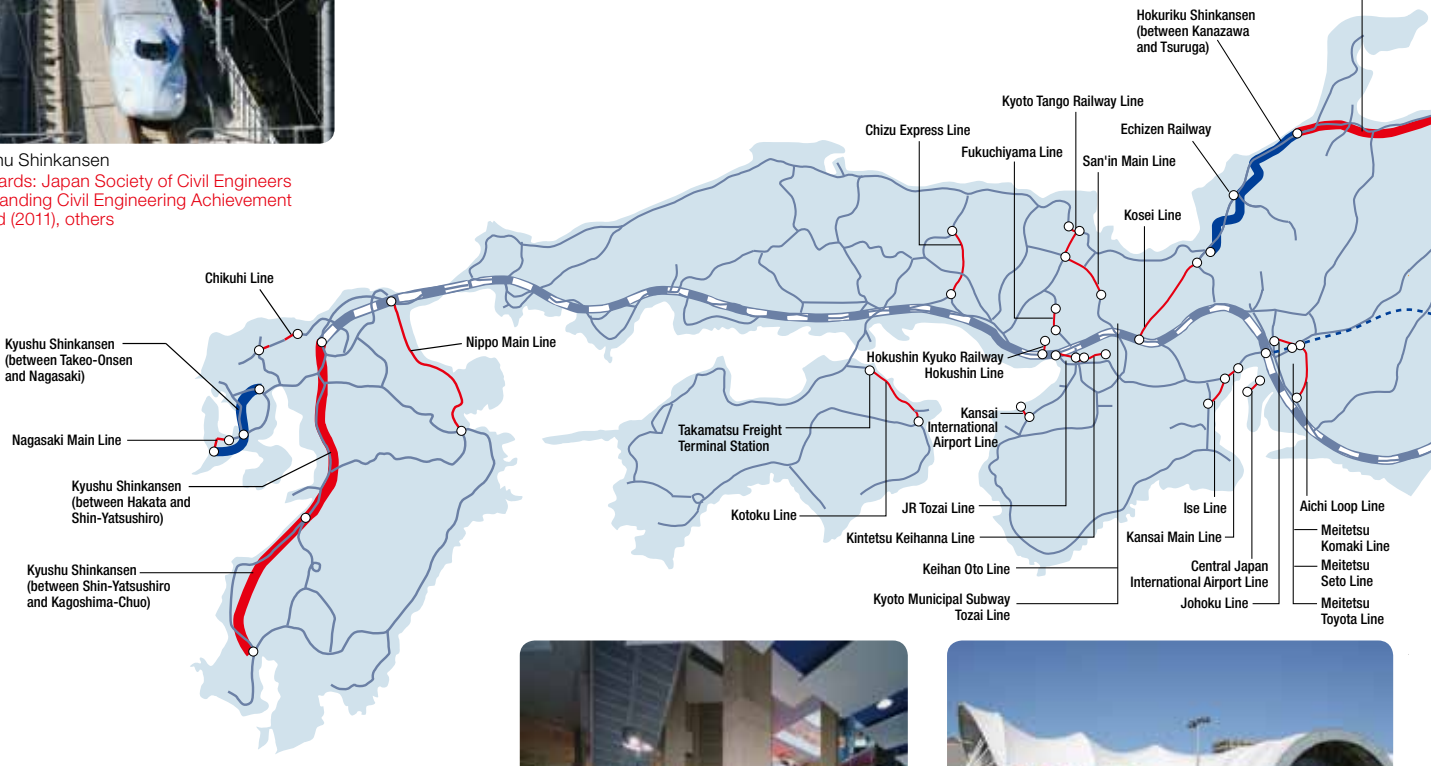
Prominent Railway Construction Efforts

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 roughly 3,640 km on 118 railways, including the Hokkaido Shinkansen between Shin-Aomori and Shin-Hakodate-Hokuto 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.

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

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



Main Railway Lines Developed by JRTT

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

Existing Lines

- Shinkansen Lines
- Conventional lines

Minatomirai Line
●Awards: Brunel Awards Commendation (2005), others

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

Tsugaru-Kaikyo Line (Seikan Tunnel)
●Awards: Commendation by the Prime Minister (1987), others

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

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

Effects of Improvements

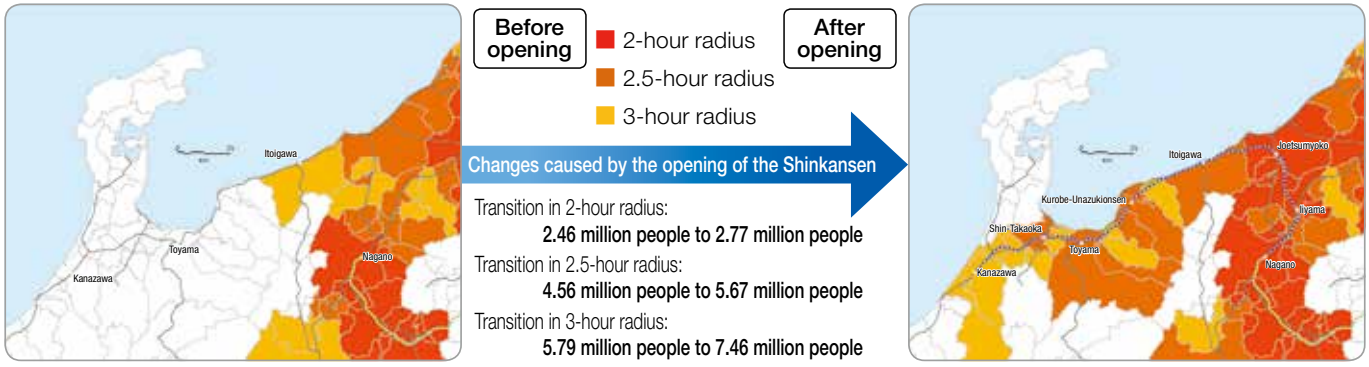
Development of the Railway networks contributes to community development.

Travel Time

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

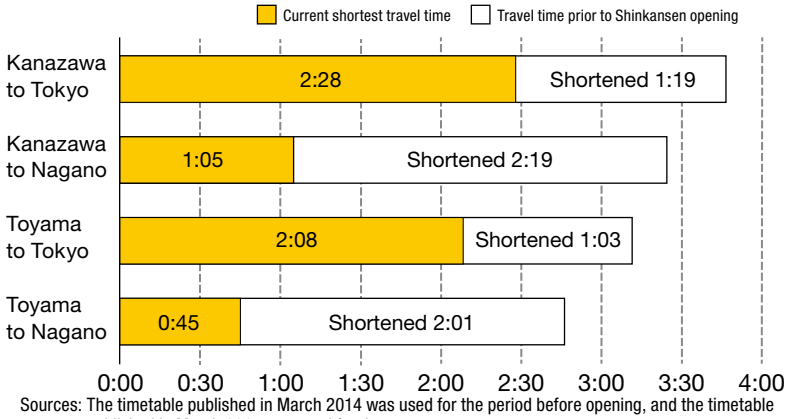
Hokuriku Shinkansen (between Nagano and Kanazawa)

Travel Time to Tokyo Station



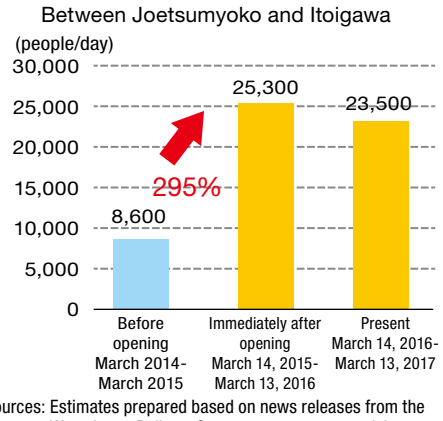
Note: "Transition to 2.5-hour radius" is the total population of the 2-hour radius and the 2.5-hour radius; "Transition to 3-hour radius" is the total population of the 2-hour radius, the 2.5-hour radius and the 3-hour radius.
Sources: The 2015 Population Census (Totals for municipalities as of March 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

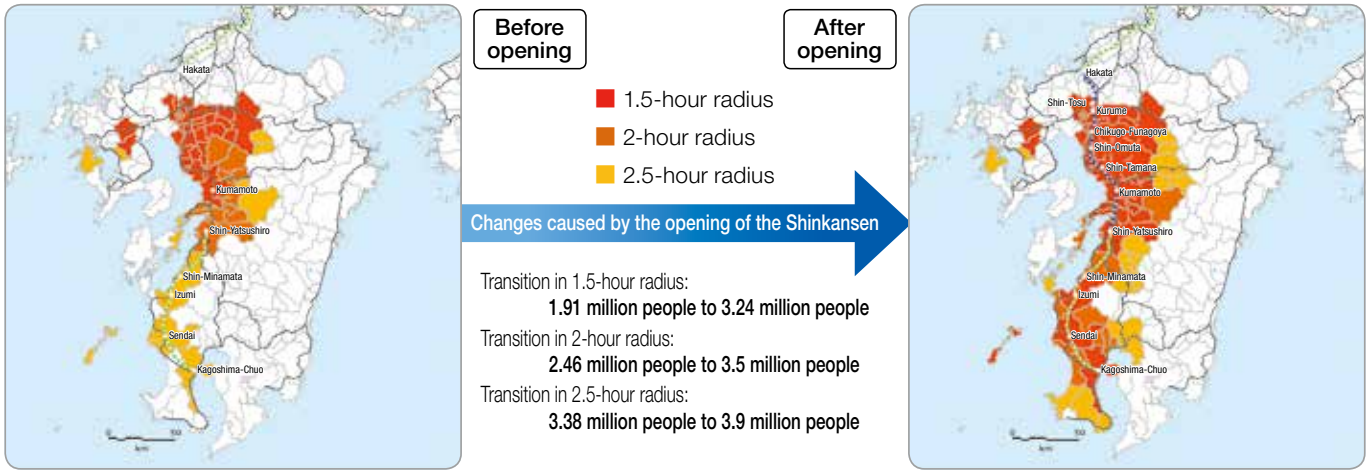
Changes in Average Number of Passengers



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

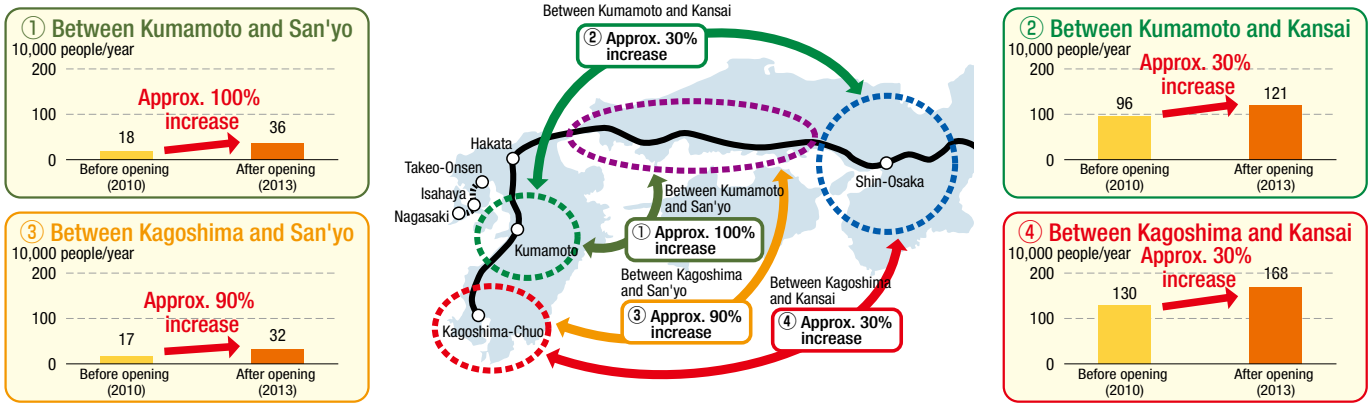


Note: "Transition to 2.0-hour radius" is the total population of the 1.5-hour radius and the 2.0-hour radius; "Transition to 2.5-hour radius" is the total population of the 1.5-hour radius, the 2.0-hour radius and the 2.5-hour radius.
Sources: The 2015 Population Census (Totals for municipalities as 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 2010 was used for the period before opening, and the timetable published in March 2012 was used for the period after opening.

Increase of Human Interaction between Regions

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

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



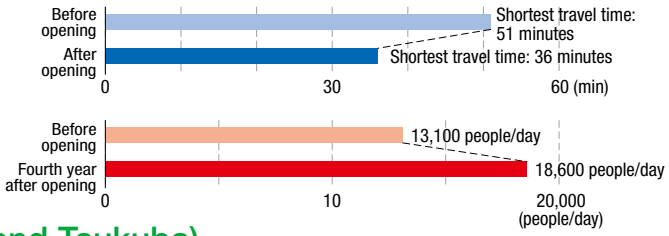
Source: Created based on "Survey of Traveler Regional Flow" by the Ministry of Land, Infrastructure, Transport and Tourism
Note 1: Kansai includes Osaka, Kyoto, Hyogo, Nara, Shiga and Wakayama Prefectures
Note 2: San'yo includes Okayama, Hiroshima and Yamaguchi Prefectures

Development of Regional Communities

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

The Narita Sky Access Line trims 36 minutes from the travel time between central Tokyo and Narita Airport, and passenger numbers increased 40% in the line's first four years of operation.

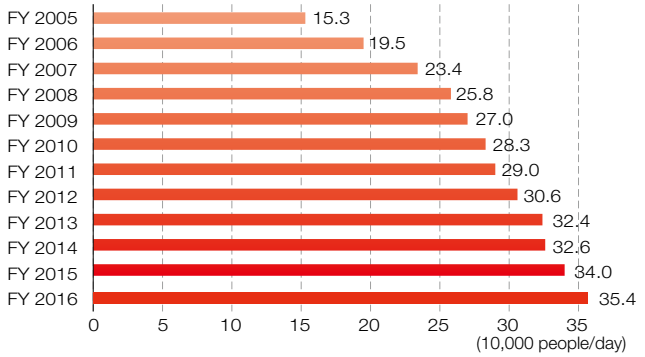
Source: Created based on data from Narita Rapid Rail Access Company.



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 130% increase in users in the line's first 10 years after opening.

Area around Kashiwanoha-campus Station



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

Hokuriku Shinkansen (Sakudaira Station)

A new community has grown around the station.

Sakudaira Station

Kyushu Shinkansen (Kagoshima-Chuo Station)

A bus terminal, parking lot and other improvements continue to be made around the Shinkansen, which is the core of a wide-ranging transportation network.

Kagoshima-Chuo Station

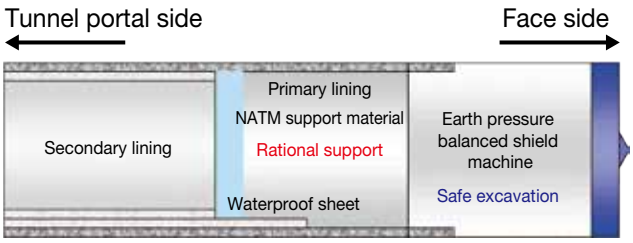
Development of New Technology and Research

SENS (Cast-in-Place Pile Support System based on the Shield Method)

SENS stands for Shield ECL NATM System. It is a new tunnel construction system that combines the advantages of several methods. The stability of the tunneling shield from the Shield Method is combined with cast-in-place concrete from the ECL Method and the support from NATM. Using this method on the frontier of the Bedrock Tunneling Method and the Shield Method enables us to safely and economically construct underground tunnels.

We used SENS for the first time to construct the Sanbongihara Tunnel between Hachinohe and Shin-Aomori on the Tohoku Shinkansen, and then to construct the Tsugaru-Yomogita Tunnel between Shin-Aomori and Shin-Hakodate-Hokuto on the Hokkaido Shinkansen. We expanded the application of the method into urban railway tunnels, and have used it to construct the Nishiya Tunnel on the Through Line between Sotetsu and JR and others.

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



Inner formwork (viewed from behind the shield)

GRS-Integrated Bridges

The structure of geosynthetic-reinforced soil (GRS) integrated bridges integrates 3 members: bridge girders, abutments and embankments (segment improvement approach blocks) behind abutments reinforced with geosynthetics (nets made of reinforcement material, laid in sheets within embankments). The resulting gate-shaped structure requires no support members, which provides benefits such as reduced construction costs and lower maintenance workloads.

We first used this technology on the Chugakko Line Overpass between Shin-Aomori and Shin-Hakodate-Hokuto on the Hokkaido Shinkansen. Because the lack of support members should enable GRS-integrated bridges to stand firm against tsunami waves, we installed them at 3 additional locations on the Sanriku Railway for which we were contracted to perform reconstruction work.

●Awards: Japan Society of Civil Engineers Tanaka Award (2014), Japanese Geotechnical Society Technical Excellence Award (2013, 2014)

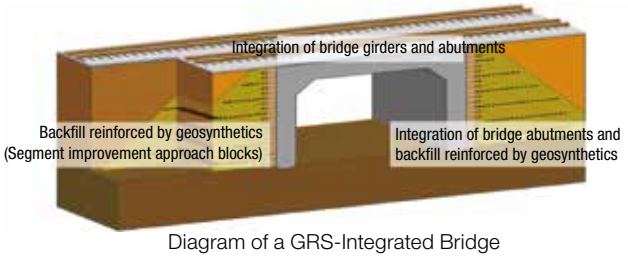


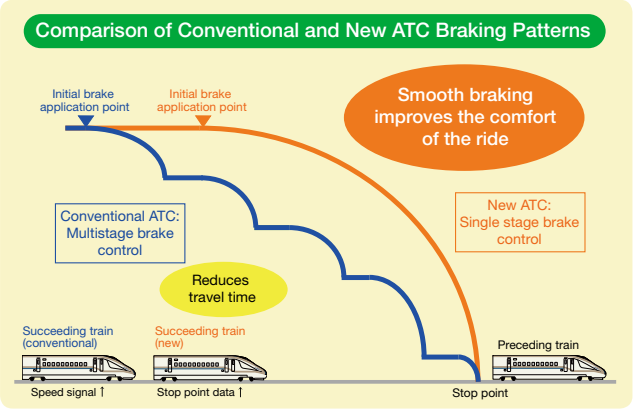
Diagram of a GRS-Integrated Bridge

Haipesawa Bridge, Sanriku Railway

New Train Control System

To improve the comfort of the ride and shorten operation times and intervals on the Tohoku Shinkansen between Hachinohe and Shin-Aomori, we used the car-initiated ATC that we introduced on the Tohoku Shinkansen between Morioka and Hachinohe to develop the Non-insulated Track Circuits—the first of its kind on a Shinkansen line—in an effort to simplify both facilities near the tracks and maintenance. To further spread the application of these effects, we also developed the technology so that it is applicable in sections between Nagano and Kanazawa on the Hokuriku Shinkansen where the commercial frequency is 60 Hz.

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



New Snow Prevention Equipment

We have developed and installed snow prevention equipment on Shinkansen lines that have made major contributions to safe transportation in winter.

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

Air-type rapid snow removal equipment
Equipment that rapidly removes snow that falls from rolling stock onto point frogs (Hokkaido Shinkansen)

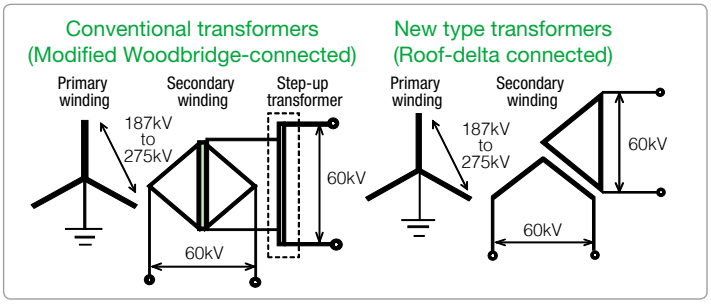
Snow removal sprinklers
(Hokuriku Shinkansen)

Eco-Friendly Roof-Delta Connected Transformers

We put roof-delta connected transformers to practical use as alternating current feeding transformers for supervoltage power reception on Shinkansen lines to replace conventional modified Woodbridge-connected transformers, and began using the new transformers on the Tohoku Shinkansen between Hachinohe and Shin-Aomori.

Compared to conventional transformers, the new transformers have a simpler structure and are smaller and more lightweight, which prevents the loss of electricity and is more eco-friendly.

●Awards: Japan Electric Association Shibusawa Award (2007)



Shin-Hakodate Transformer Substation

Assistance for Technological Development

Technological Development for Safety Measures, Environmental Measures, etc.

To promote the development of railway technology and the improvement of technical standards, we provide assistance to corporations with the capacity to develop technology related to the railway sector.

Platform edge doors (Mitsubishi Heavy Industries Transportation Equipment Engineering & Service Company)

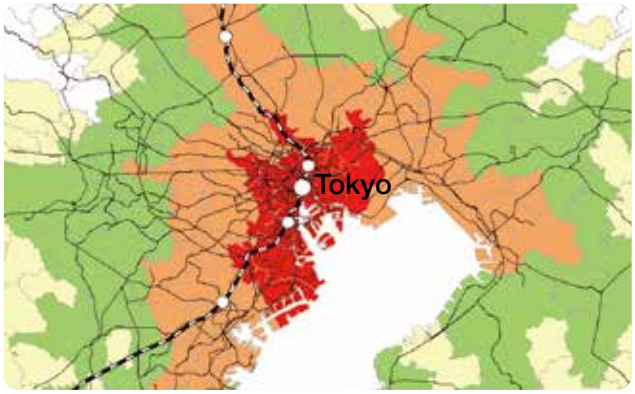
Research for Railway Plans and Assistance

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 Assistance System

GRAPE* is a system that uses geographic information systems (GIS) to provide assistance for the development of transportation plans, primarily for railways. The system is useful not only for constructing new railway lines, but also for providing visual aids for the analysis and evaluation of policies to improve railway convenience, such as streamlining transfers and revising schedules. GRAPE: GIS for Railways Project Evaluation

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



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

Promotion of Universal Design and Use of Locally Sourced Materials

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


Itoigawa Station, Hokuriku Shinkansen


Iiyama Station, Hokuriku Shinkansen

Easy to use Vertical Equipment

We install glass-paneled elevators for higher visibility and crime prevention and make them large enough to accommodate wheelchairs and strollers. We install both escalators and stairs so that passengers can use either to easily move up and down.


Shin-Tamana Station, Kyushu Shinkansen


Kenkyu-gakuen Station, Tsukuba Express

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

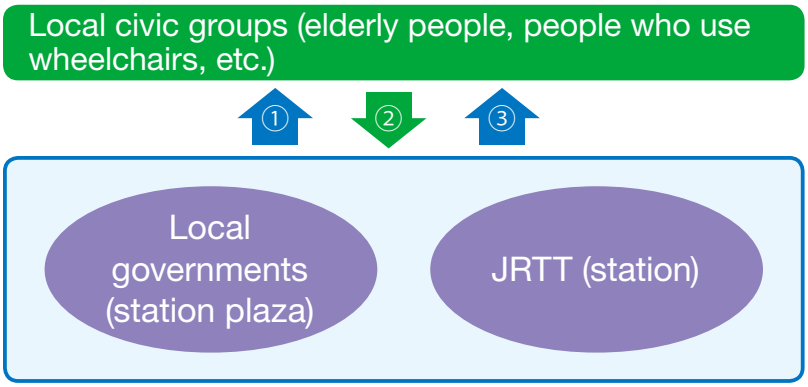

Kikonai Station, Hokkaido Shinkansen

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.

Shin-Hakodate-Hokuto Station, Hokkaido Shinkansen

● Universal Design Flow Chart



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

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 CO_2 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

Nemagari-sugi cedar bench

Joetsu-Myoko Station, Hokuriku Shinkansen

Donan (Southern Hokkaido) cedar

Shin-Hakodate-Hokuto Station, Hokkaido Shinkansen

Cedar from Kumamoto Prefecture

Shin-Tamana Station, Kyushu Shinkansen

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

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 Distribution
- ○Promoting a modal shift

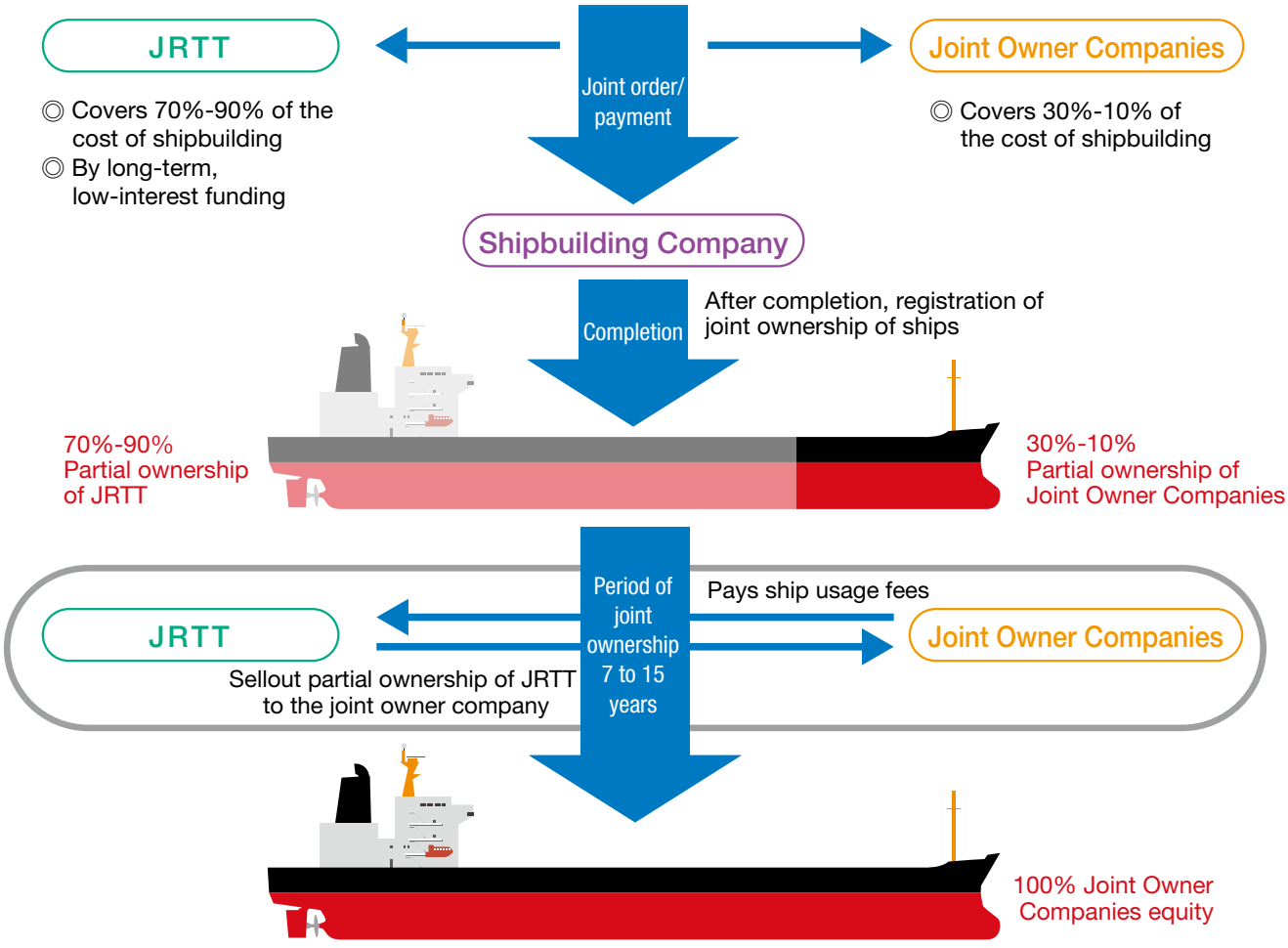
Employing crewmembers
- ○Promoting the planned employment of young crewmembers, female crewmembers, etc.
- ○Promoting the diffusion of ships with improved working environments

Strengthening Business Foundations
- ○Preparing a stable, efficient business environment for coastal ship-owners

Reinvigoration/revitalization of maritime transport
- ○Maintaining routes by streamlining management, etc.

Joint Ownership Shipbuilding Scheme

Financial Assistance



Technical Assistance

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.

A meeting with engineers

Planning → Design → Shipbuilding → Sea trials → Completion and Entering into Service → Guarantee dock → Solutions to problems

Supervision by engineers during sea trials

Supervision by engineers during shipbuilding

Main Efforts

Promotion of Shipbuilding that Contributes to Environmental Conservation

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.

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

Promotion of the Shipbuilding for Routes to Remote Islands

Over the past 50-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.

The Tobishima, a 19G/T passenger ship for routes to remote islands between Imabari, Munakata, Oge, Kouge and Okamura

Expanding the Target of the Joint Ownership Shipbuilding Scheme

In FY 2018, we added domestic cruise ships to the scope of the joint ownership shipbuilding scheme to respond to inbound tourism demand.

To counter the dearth of crewmembers, we created a reduced interest rate for ships with improved working environments that aim to reduce crewmember workloads and improve their living environments.

Achievement of Joint Ownership Shipbuilding

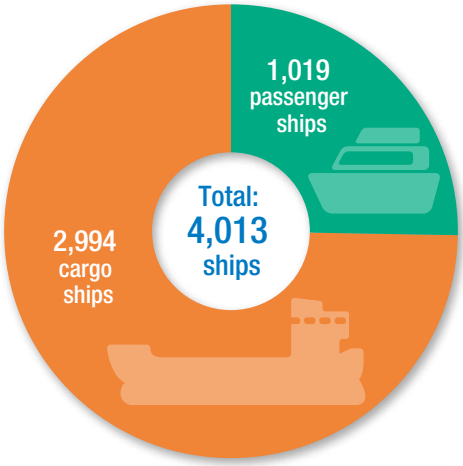
Through joint ownership shipbuilding of domestically operated passenger and cargo ships, JRTT assists the national economy and people's lives in Japan.

Prominent Shipbuilding Efforts of JRTT

Over the years since the establishment of the Maritime Credit Corporation—the predecessor to JRTT—in 1959, we have built a total of over 4,000 ships. As the largest shipowners in Japan—we own 267 cargo ships and 56 passenger ships as of March 31, 2017—we contribute to regional revitalization and the streamlining of logistics. Over that period, we have received many awards.

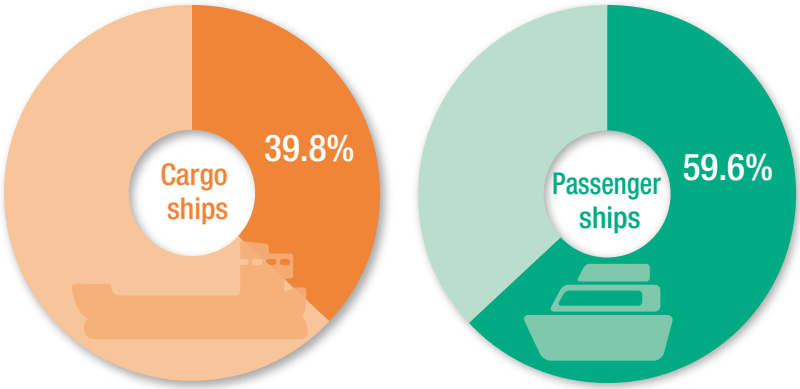
Total JRTT Shipbuilding Efforts

*Completed ships from 1959-March 2018



Shipbuilding Share

Percentage of ships by the joint ownership shipbuilding scheme in use among new ships sailing within Japan (based on gross tonnage)
*FY 2012-FY 2016 average



JRTT's Cargo Ships

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

The Miyuki,
a 749-G/T container ship

The Fukuei Maru No. 2,
a 252-G/T oil tanker

The Kamikita Maru,
a 12,430-G/T RORO ship

The Ryusei Maru,
a 498-G/T chemical tanker

The Kousyu Maru No. 11,
a 747-G/T LPG tanker

JRTT's Passenger Ships

Ships for Routes to Remote Islands

The Futaoi Maru, a 49-G/T passenger ship that runs between Futaoijima and Yoshimi

The Iwai, a 43-G/T passenger ship that runs between Iwaishima and Yanai

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

The 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

The Akane, a 5,702-G/T high-speed ferry that runs between Ogi and Naoetsu

The Ferry Toshima 2, a 1,953-G/T ferry that runs between Naze (Amami Oshima), Takarajima, Kodakarajima, Akusekijima, Suwanosejima, Tairajima, Nakanoshima, Kuchinoshima and Kagoshima

The Oike Maru, a 19-G/T passenger ship that runs between Tebajima and Mugi

The Ogasawara Maru, a 11,035-G/T ferry that runs between Tokyo and Chichijima

Long-Distance Ferries, etc.

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

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

The Akebono Maru, a 2,694-G/T ferry that runs between Yawatahama and Usuki

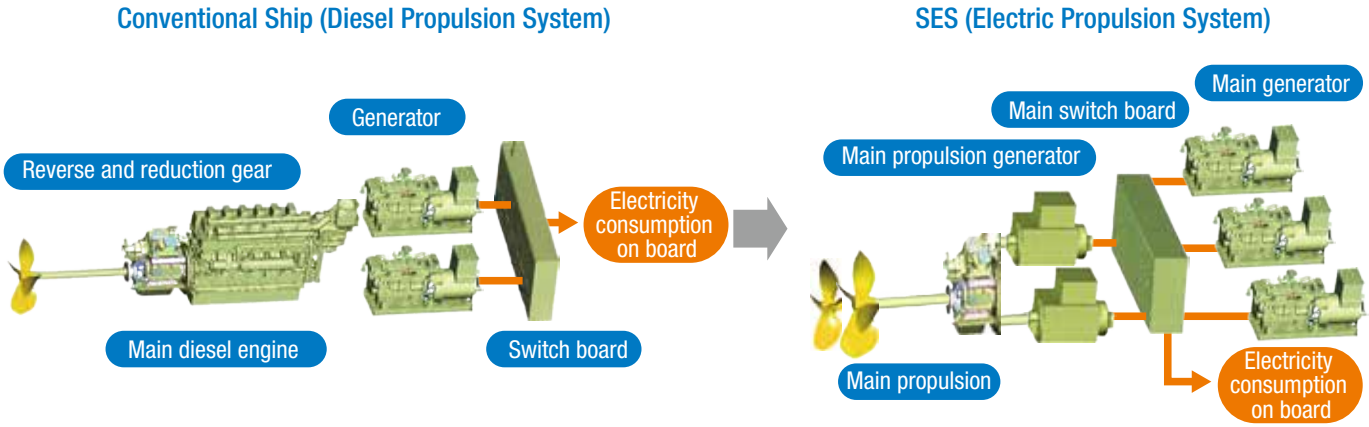
The Osaka II, a 14,920-G/T ferry that runs between Osaka Nanko and Shin-Moji

Diffusion and Promotion of New Technology

We also promote the diffusion of ship technology that contributes to reducing environmental burdens, streamlining coastal shipping and other efforts.

Super Eco-Ships

To promote shipbuilding to replace existing coastal ships, streamline distribution, reduce environmental burdens and otherwise respond to the demands of society, we promote the diffusion of eco-friendly, economical electric propulsion ships known as Super Eco-Ships (SES).



Effects of SES Introduction

Increased Efficiency
- ➡Energy Conservation
  Roughly 20%

Eco-Friendly
- ➡CO_2 Reduced by roughly 20%
- ➡NO_X Reduced by roughly 40%
- ➡SO_X Reduced by roughly 20%

Comfort for Passengers and Crew
- ➡Reduced vibrations and noise
  Reduced by 5-10 dB
  (as quiet as a passenger car)
- ➡Reduced engine operation/maintenance work, etc.

Increased Safety
- ➡Lower failure rate, plus ability to operate under partial failures
- ➡Improved ship handling
  (especially within harbors)

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 research to them as technological data.

Feasibility Study on the Introduction of IoT Technology for Coastal Ships (FY 2017)

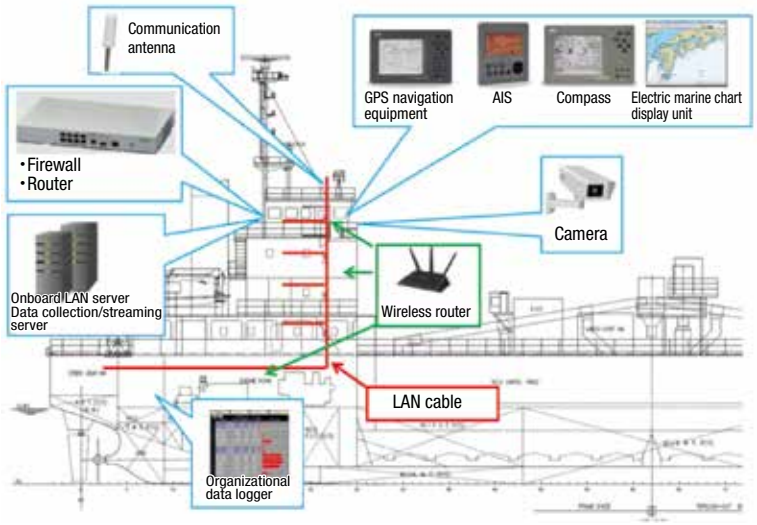
Securing and training crew members continues to be a critical issue in coastal shipping in Japan. It is more important than ever before to introduce new technology to reduce workloads and improve productivity in order to promote the employment and retention of crewmembers through the creation of appealing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

Therefore, we conducted a study of available IoT 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.

Ships with Improved Working Environments
➡Ships on which measures are taken to reduce crewmember workloads and improve their living environments

Available IoT Equipment for Coastal Ships



Studies of SES Passenger Ships for Routes to Remote Islands (FY 2016-present)

To promote the construction of Super Eco-Ships (SES), we have conducted studies of the total cost, which is the sum of the initial shipbuilding cost and ongoing maintenance cost.

The Sakurajima Maru No. 2, a SES ferry that runs between Sakurajima and Kagoshima

Providing Information Based on Technological Studies

We are providing information through seminars to diffuse and promote onboard IoT technology and other technology for ships. We also provide information based on technological studies through our website, which contains a handbook for energy- and power-saving equipment, design documents that result from studies of ship types, an energy conservation manual for small, high-speed passenger ferries, and more.

Scene from a seminar

Technological information

Column

Shipbuilding by Universal Design

To enable elderly people, handicapped people and others to travel smoothly on public transportation, we build passenger ships that comply with standards set out by the Japanese government.

The Sunflower Satsuma, JRTT's passenger ferry that runs between Osaka and Shibushi

This 719-passenger ferry has been upgraded to include Universal Design guestrooms and other barrier-free facilities. The addition of Universal Design Suites and other efforts to upgrade guestrooms to Universal Design standards means that all passengers—regardless of ability—can enjoy their time aboard the ferry.

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

A Universal Design Suite

The bath and toilet in a Universal Design Suite

Standard Cabin upgraded to Universal Design

International Affairs

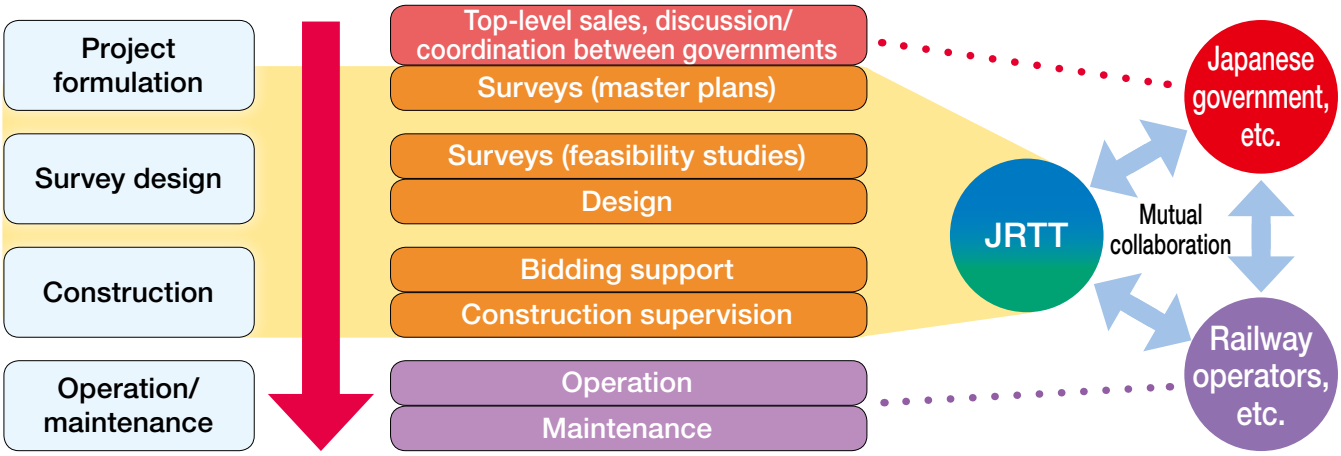
Participation in Overseas High-Speed Rail Projects

Recently, awareness of global environmental issues has grown and the demand for inter- and intra-city transportation has been increasing along with economic growth in developing countries in Asia and elsewhere. Therefore, expectations of railways have increased as an excellent mass transit system with a small environmental burden. Presently, many railway projects are being planned and investigated throughout the world, and the railway market is projected to expand to roughly 24 trillion yen by 2021.

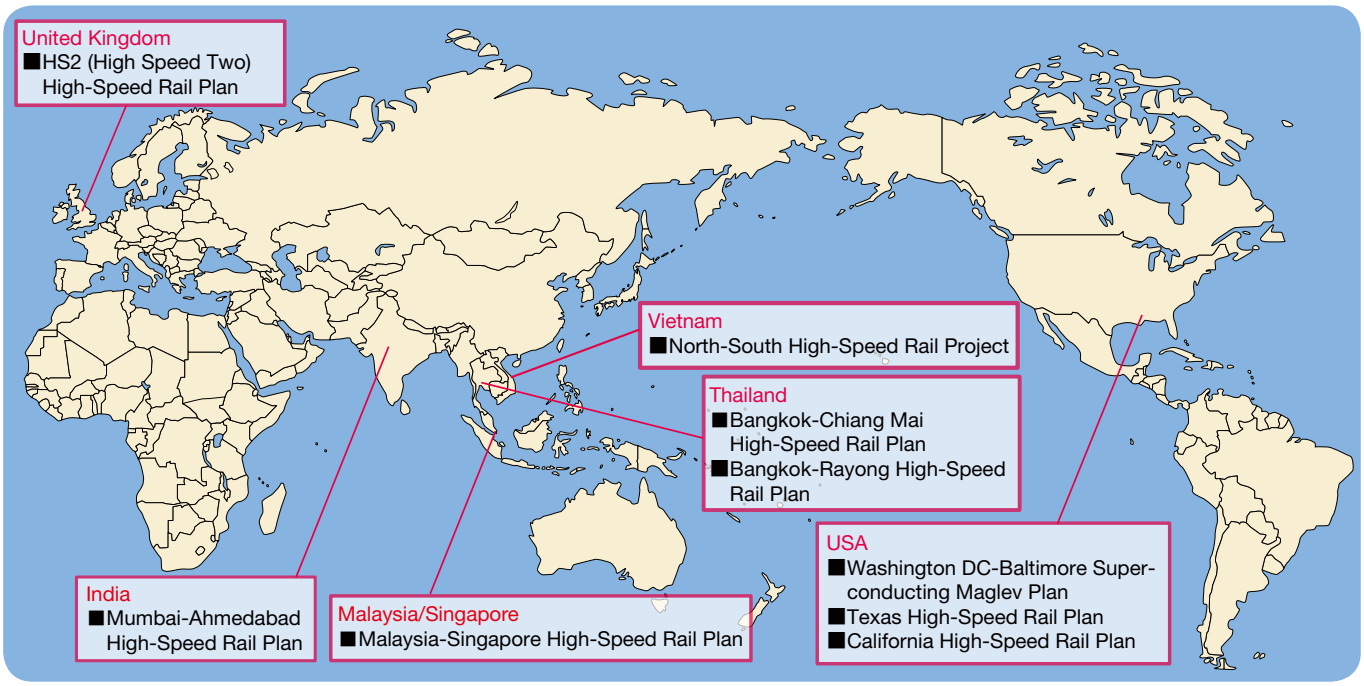
However, the construction of high-speed rail requires concerted efforts in construction work for civil engineering, buildings, tracks, electricity and machinery from the investigation stage through to completion. Private companies lack the capacity to fully execute all of these functions in addition to coordinating between departments. Therefore, as JRTT is expected to play a proactive role in coordinating the construction of projected Shinkansen lines in high-speed railway projects overseas, the Japanese government enacted “the Act on the Promotion of the Participation of Japanese Business in Overseas Infrastructure Projects” in August 2018. This act enables JRTT to participate in high-speed rail projects all over the world.

We intend to make full use of the know-how and knowledge we have cultivated through the construction of Shinkansen and other railway lines to date to help build the transportation networks of tomorrow both inside and outside Japan.

Main roles of JRTT



Prominent High-Speed Rail Projects



High-speed rail projects extracted from "Action Plan 2018 of MLIT for the Overseas Expansion of Infrastructure Systems" (March 2018)

Overseas Technical Cooperation

Since 1964, JRTT has contributed to build railways all over the world by dispatching many railway experts based on requests from MLIT 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 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 2006 marked the first time Japan exported its Shinkansen system. JRTT dispatched employees and cooperated with the project from the planning stages in 1989. Specifically, our cooperation started with the participation of our employees in the feasibility study during the investigation stage, and continued into the bidding stage where we provided recommendations and close investigations of written proposals in technical terms. After the decision was made to introduce the Shinkansen system, we dispatched many of our employees 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 opening. We believe this project is both a successful example of the export of the Japanese Shinkansen system, and a successful example of our comprehensive railway construction technology and know-how amassed in Japan and put to work overseas from the planning stage until the line opened.

Technical cooperation for track/electrical construction on Taiwan High Speed Rail

A field survey for the high-speed rail in India

India High-Speed Rail Project

At a meeting between heads of state in December 2015, the governments of Japan and India concluded a memorandum of understanding regarding the introduction of a Shinkansen system; the two governments decided that India's high-speed rail between Mumbai and Ahmedabad would be a Japanese Shinkansen. JRTT 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 fellows from India, and given them tours of Shinkansen construction sites to help them further their understanding of safety in construction.

Technology Exchange with Sweden

As interest in high-speed rail grows in Sweden, the Japanese MLIT and Swedish ministry of industry concluded a memorandum of understanding regarding cooperation in the railway sector. Based on this memorandum, JRTT 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 fellows from Sweden, and have deepened our exchange through efforts such as tours of Shinkansen construction sites.

Railway sector technology exchange with Sweden

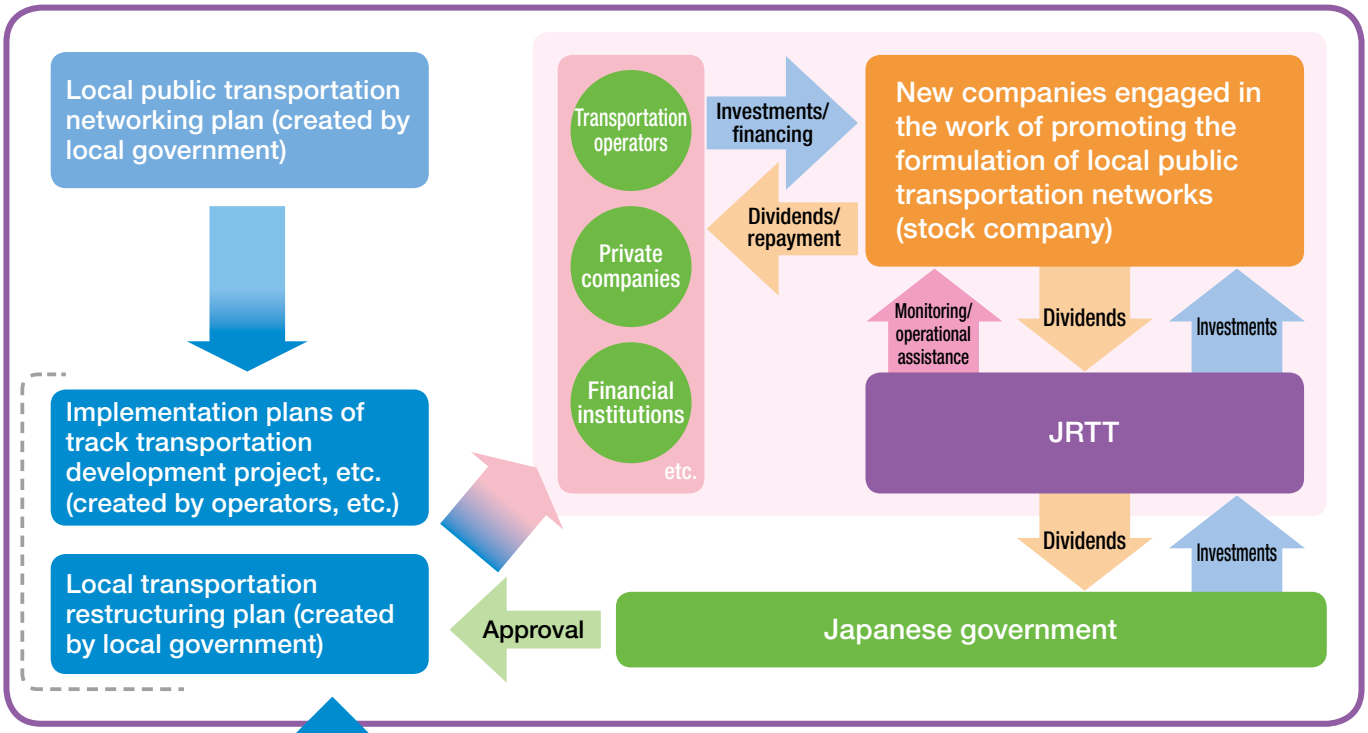
Revitalization of Regional Communities

We contribute to the revitalization of regional communities by improving overall communities, actively participating in the creation of appealing towns throughout Japan, and other efforts through our assistance via investment in sustainable regional public transportation, disposal of former Japan National Railways (JNR) land and other efforts.

Revitalization and Rehabilitation of Regional Public Transportation Through Investment

We provide funding and other assistance for the improvement of service levels, the restructuring of lines and other projects that contribute to the formulation of more sustainable local public transportation networks based on the Act on Revitalization and Rehabilitation of Local Public Transportation Systems (Act No. 59 of 2007).

Funding from JRTT 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.



Examples of Projects to Promote the Formulation of Local Public Transportation Networks

① Establishment/operation of LRT/BRT
② Rehabilitation of regional railways using vertical separation
③ Restructuring of bus route networks
④ Introduction of smart cards and informational guidance systems integrated into the projects


Integrated Circuit Card System

Light Rail Transit (LRT)
Eco-friendly and highly accessible urban public transportation systems that represent an improvement on the operating spaces and vehicle performance of conventional streetcars due to their high degree of promptness and transportation capacity.

Bus Rapid Transit (BRT)
Bus systems that handle the arterial transportation of urban areas with faster, higher-capacity services than normal buses. Articulated buses are one example.

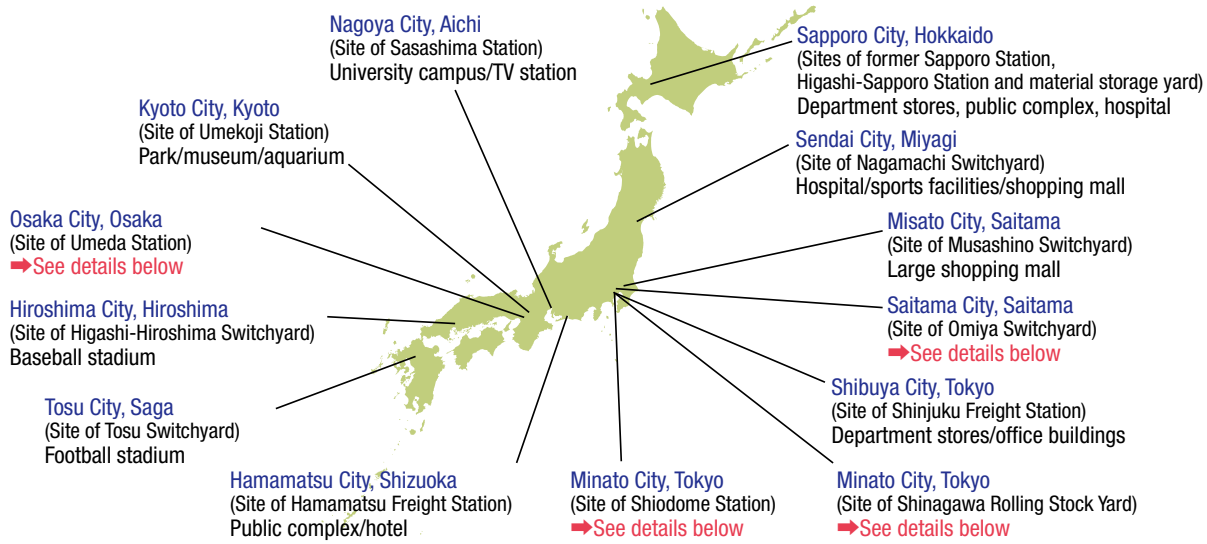

LRT


BRT

Contribute to Attractive Town Development on Land Used by the Former JNR

The JNR privatization reforms of 1987 expedited the disposal of many parcels of former JNR land throughout Japan that eventually became public utilities, commercial facilities, condominiums and residential subdivisions that served to develop urban areas and revitalize communities. The largest of those parcels contributed to the regeneration of cities and creation of appealing towns through urban development projects and the like.

Prominent Cases of Land Revitalization



Representative Cases of Districts where Land is Already Developed

Shiodome District

The valuable large-scale land asset Shiodome is a critical transportation node that connects central Tokyo to coastal areas. Now home to various mass media outlets that headline a cluster of the headquarters of major Japanese corporations, the area has been transformed into a base for transmitting global information and culture.

Shinagawa District

The east exit of Shinagawa Station is a high-functioning urban subcenter serving as the southern entryway to Tokyo. The opening of Shinagawa Station on the Tokaido Shinkansen line in 2003 and the unveiling of the Shinagawa Grand Commons shopping and office building in 2004 resulted in the creation of an attractive new urban district.

Omiya District

With the aim of improving central and core facilities in the prefecture and providing a concentration of wide-ranging administrative functions, the advantageously located Omiya Switchyard has been redeveloped into Saitama-Shintoshin, a highly accessible amalgamation of higher-order urban functions befitting a central urban area. The site opened in May 2000.

Cases of Districts where Land is Being Developed

Umeda District

Given the location and large size of the land owned by JRTT adjacent to JR Osaka Station (Phase 2 development area), it is regarded as one of the most prime urban properties in Japan. Presently, efforts such as a land readjustment project to bury the feeder to the JR Tokaido Branch Line are under way to create a new district that serves as a foundation for the fusion of environmental efforts and innovation in an effort to help Osaka fulfill its mission of building communities that drive the revitalization of the Kansai region. The first phase of development resulted in the April 2013 opening of Grand Front Osaka.

Environmental Efforts

Basic Environmental Policy

To describe our approaches and philosophies regarding environmental considerations in the course of conducting business, we have set out “Basic Environmental Policy” that we use 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.

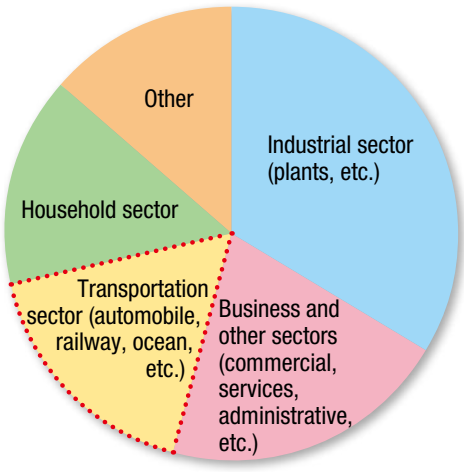
1. We strive to reduce the environmental burden created in all areas of our business activity, including railway construction, assistance for promoting the improvement of transportation infrastructure by railway companies, maritime transport companies and others, and other support.
2. We observe laws 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. In FY 2014, 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 just 4.8% and 4.3%, respectively.

Carbon Dioxide Emissions in Japan by Sector (FY 2016)



Source of Emissions	(K tons)
Industrial sector (plants, etc.)	418,000
Business and other sectors (commercial, services, administrative, etc.)	214,000
Transportation sector (automobile, railway, ocean, etc.)	215,000
Household sector	188,000
Other	171,000
Total	1,260,000

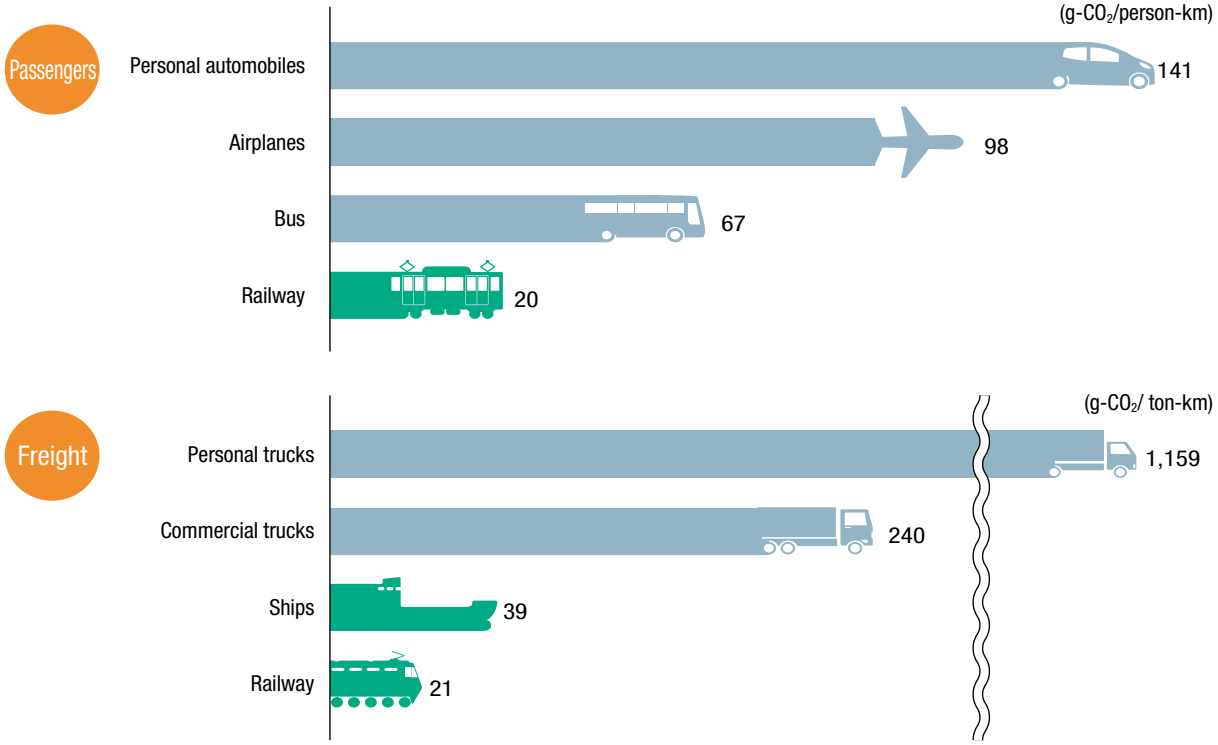
Source of Emissions	(K tons)
Automobiles	185,710 (86.2%)
Ships	10,370 (4.8%)
Airplanes	10,190 (4.7%)
Railway	9,160 (4.3%)
Total	215,000 (100%)

Source: Data based on the website of the National Institute for Environmental Studies Greenhouse Gas Inventory Office

In addition, since railway and ships are high-volume modes of transportation, a large number of people and things can be carried on each trip and voyage. Passenger railway emits 1/6 the carbon dioxide per person-kilometer of personal automobiles, and freight railway emits 1/8 the carbon dioxide per ton-kilometer of commercial trucks, while ships emit 1/5 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 (FY 2016)



Source: Data based on the website of the MLIT (Ministry of Land, Infrastructure, Transport and Tourism), Policy Bureau Environmental Policy Division

Sharing Environmental Information and Social Contribution Activities

To further understand about 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.

Railway Festival

A technical seminar about coastal shipping

Spreading Environmental Information

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.

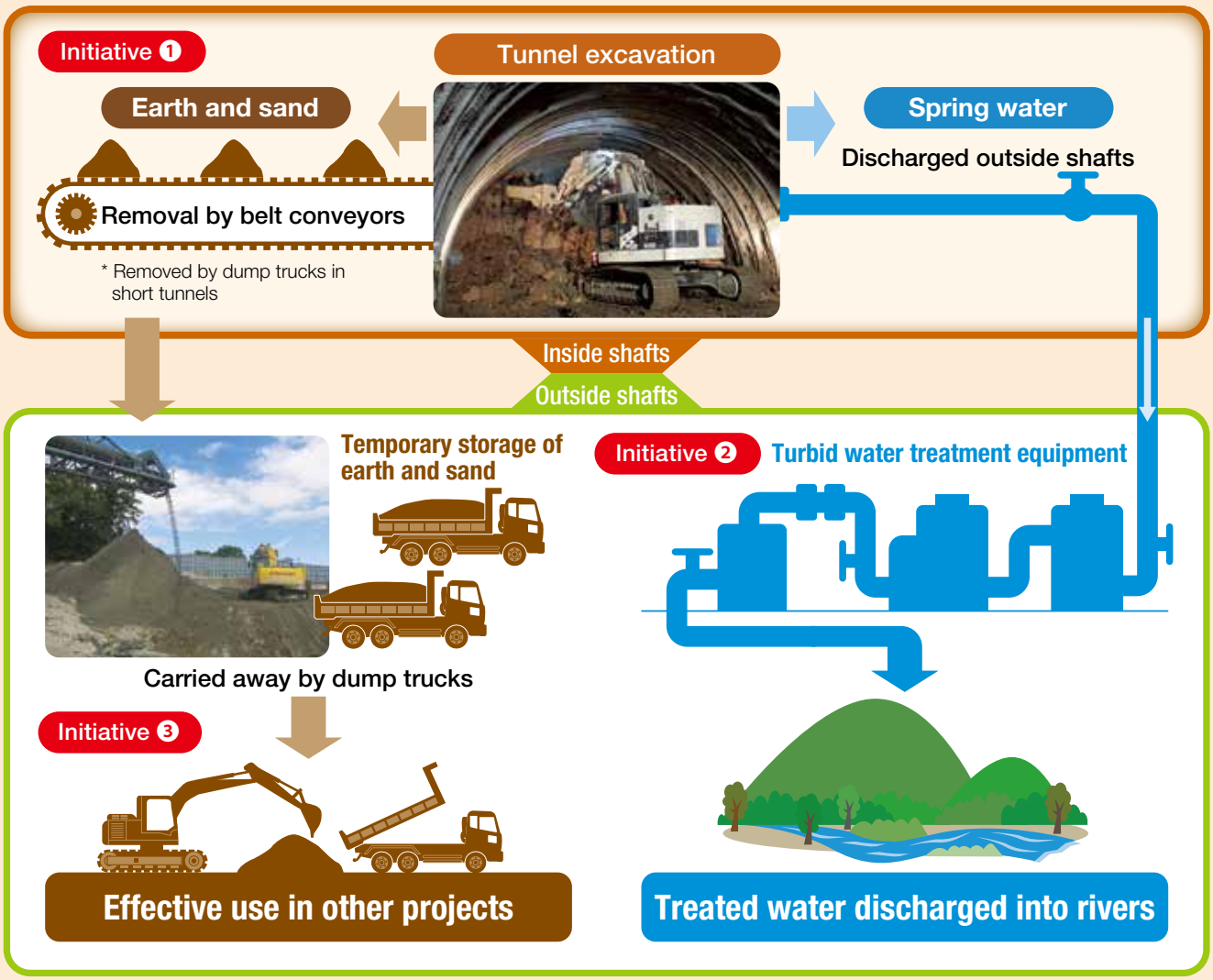
Environmental Efforts http://www.jrtt.go.jp/01Organization/Csr/csr-kankyo.html

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

Image of Efforts in Tunnel Construction



Promotion of Shipbuilding that Contributes 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 that contribute to the greening of coastal shipping.

The Tachibana Maru, an SES ferry that runs between Tokyo, Miyakejima, Mikurajima and Hachijojima
●Awards: Ship of the Year 2014, awarded in the large-sized passenger ship category

Initiative 1 Removal of Excavated Earth by Belt Conveyors

Earth and sand generated by excavation in tunnel construction is 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 the Murayama Tunnel on the Hokkaido Shinkansen between Shin-Hakodate-Hokuto and Sapporo, and in the Shin-Nagasaki Tunnel on the Kyushu Shinkansen between Takeo-Onsen and Nagasaki. 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 to improve 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.

Earth and sand removal by belt conveyor inside a shaft

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 satisfy 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.).

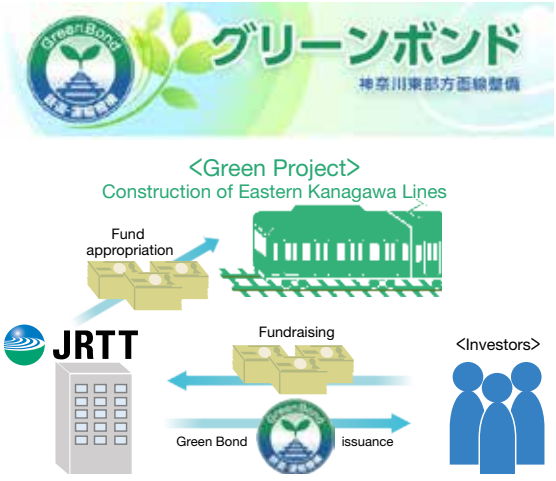
Use of soil generated by construction in a residential land development project

Efforts in Issuing Green Bonds

Green bonds are an effective tool for incorporating private capital into green projects that strive to counter global warming and prevent the deterioration of natural capital. JRTT issued green bonds to fund the project to enhance the convenience of urban railways (the construction of the Eastern Kanagawa Lines).

Our efforts were selected as a model example of green bond issuance for the Ministry of the Environment's 2017 Green Bond Issuance Model Creation Project, and were recognized as compliant with the ministry's "Green Bond Guidelines, 2017."

As an investment in a project to improve the environment through CO_2 reduction and other measures, our green bonds contribute to the development of ESG investment, which is gaining prominence on the world stage.

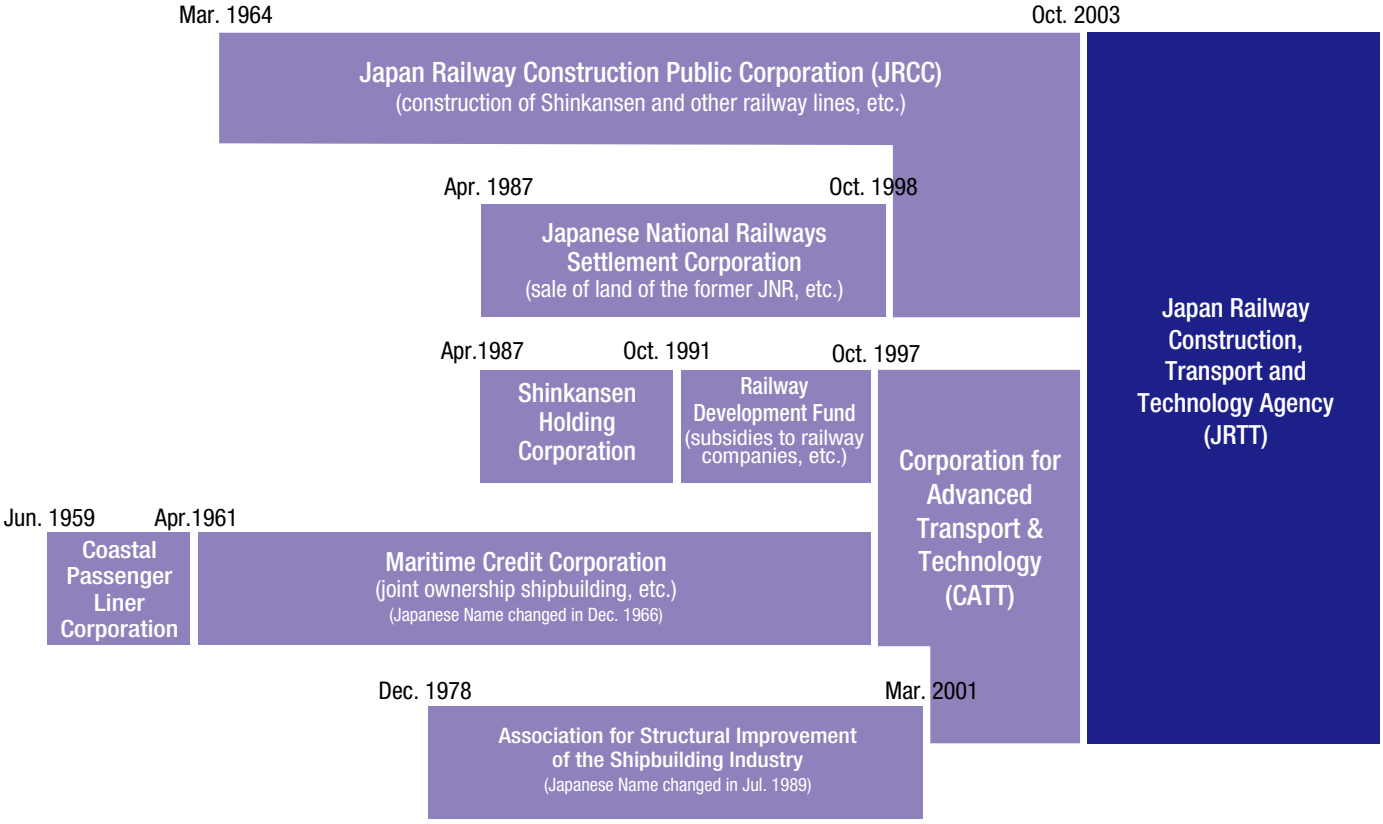


Overview

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

Name in Japanese:	独立行政法人　鉄道建設・運輸施設整備支援機構 （略称　鉄道・運輸機構）
Name in English:	Japan Railway Construction, Transport and Technology Agency (abbreviated name: JRTT)
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, maritime transport companies and others, and other assistance. Also, to contribute to the stable development of the national economy and improving the lifestyle of the public.

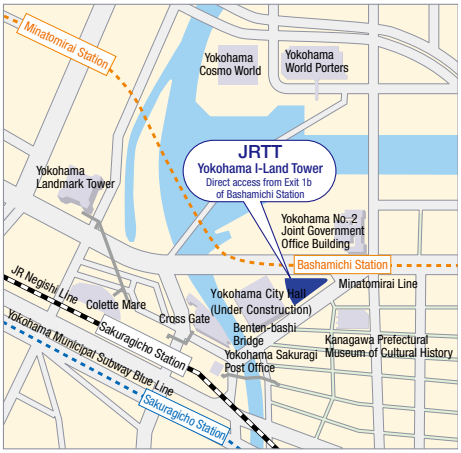
Corporate History



Organizational Chart, Adress (as of August 31, 2018)

- President
  - Vice-President
  - Deputy President
  - Executive Director (7)
  - Auditor (3)
- Director-General for Special Project Coordination and Land
- Director-General for Audit and Project Management
- Director-General for Facility Management and Central Shinkansen Financing
- Director-General for Railway Development
- Director-General for Construction
- Director-General for JNR Settlement Land Bussiness
- Director-General for JR Full Privatization Promotion
- Deputy Director-General
- Audit Department
- General Affairs Department
- Corporate Planning Department
- Finance and Fund Planning Department
- Project Management Department
- Facility Management Department
- Railway Development Department
- Engineering Affairs and Transportation Research/Planning Department
- Design Department
- Land Department
- Equipment Department
- Electrical Engineering Department
- Shinkansen Department
- Construction Department
- 2nd Construction Department
- International Affairs Department
- Joint Construction of Ship Planning and Management Department
- Joint Construction of Ship Assistance Department
- JNR Settlement Administration Department
- JNR Settlement Land Business Department
- JR Full Privatization Promotion and Finance Department
- Mutual Assistance Insurance Department

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

Local Branch Bureaus

- Tokyo Regional Bureau
  Shiba Park Building B
  2-4-1 Shibakoen, Minato City, Tokyo, 105-0011 Japan
- Osaka Regional Bureau
  Shin-Osaka Trust Tower
  3-5-36 Miyahara, Yodogawa-ku, Osaka City, Osaka, 532-0003 Japan
- Hokkaido Shinkansen Construction Bureau
  Maruito Sapporo Building
  Kita 2-jo 1-1 Nishi, Chuo-ku, Sapporo City, Hokkaido, 060-0002 Japan
- Kyushu Shinkansen Construction Bureau
  City 17 Building
  2-1 Gion-machi, Hakata-ku, Fukuoka City, Fukuoka, 812-8622 Japan
- Aomori Construction Bureau
  Aomori Shinmachi 2-Chome Building
  2-2-4 Shinmachi, Aomori City, Aomori, 030-0801 Japan
- Kanto-Koshin Construction Bureau
  Kaneko No. 1 Building
  2-5-11 Shinyokohama, Kohoku-ku. Yokohama City, Kanagawa, 222-0033 Japan

JRTT

Japan Railway Construction, Transport and Technology Agency

www.jrtt.go.jp

Contact

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