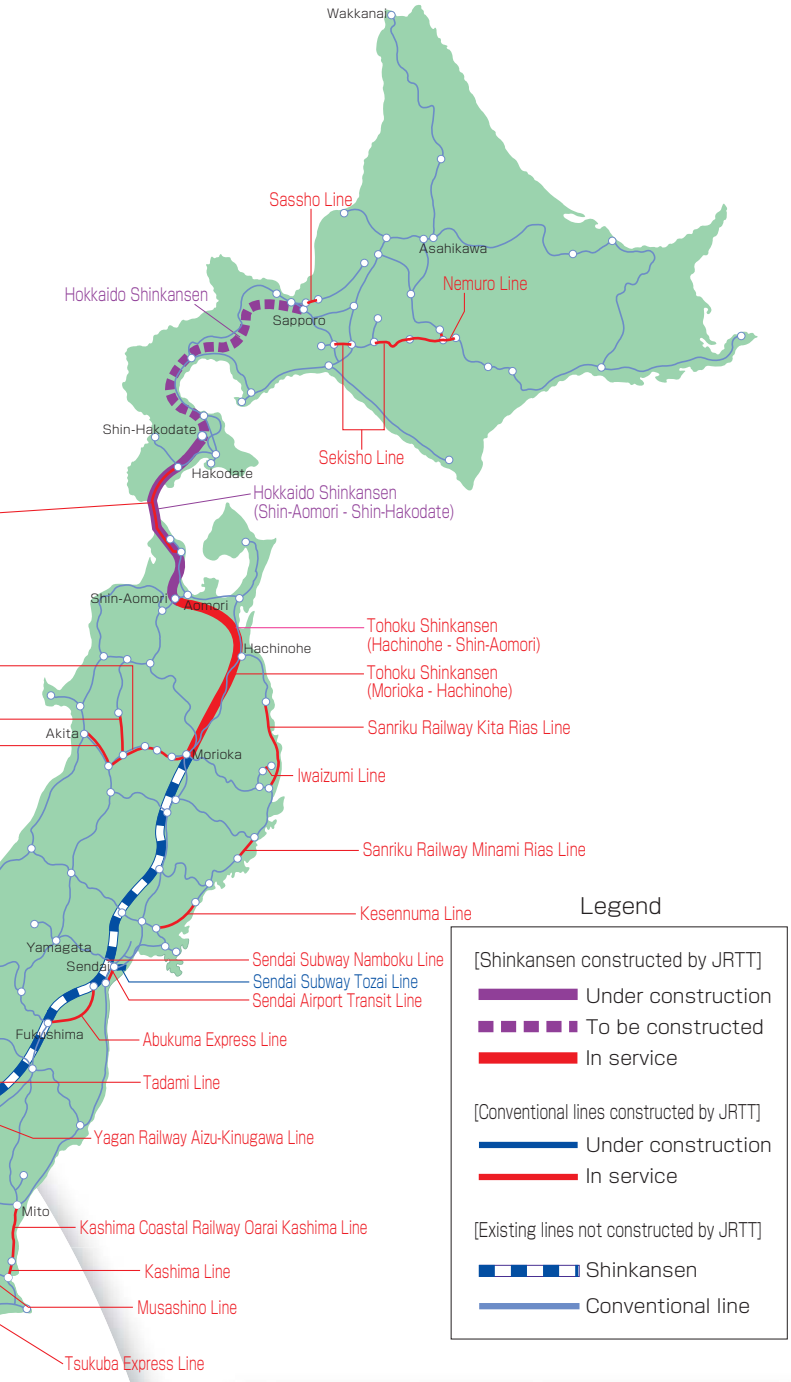
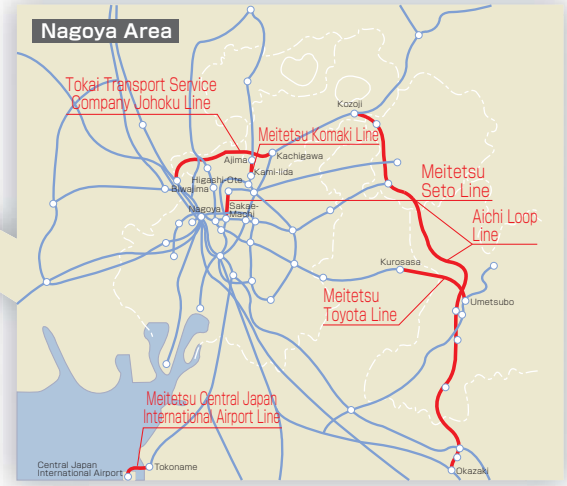
Japan Railway Construction, Transport and Technology Agency

JRTT

The railway networks constructed by JRTT



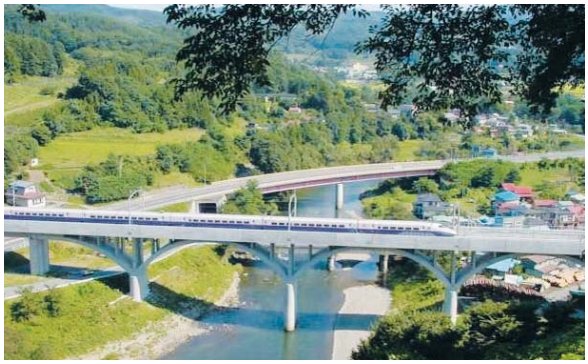


Contents

Major railway construction

New Shinkansen lines

We are working on construction of the Hokkaido Shinkansen (Shin-Aomori - Shin-Hakodate), Hokuriku Shinkansen (Nagano - Kanazawa) and Kyushu Shinkansen (Takeo-Onsen - Isahaya) lines.



See pages 8 to 15.

Urban railways

We are proceeding with construction of a through line between the Sotetsu Line and the Tokyu Line, as well as between the Sotetsu Line and the JR Line, under the Urban Railway Convenience Enhancement Project, and have been entrusted with construction of the Sendai Subway Tozai Line, etc.

See pages 16 to 21.

projects JRTT is working on

Railway construction technologies

As a result of our technical achievements in a number of fields including tunnels, bridges, etc., and the wide range of our design and construction technology, we are constantly offering railway facilities that meet every possible need by using the most advanced technologies.

See pages 30 to 36.

Yamanashi Maglev Test Line

See pages 22 and 23.

Following the construction of the priority section, we were commissioned to construct the remaining section.

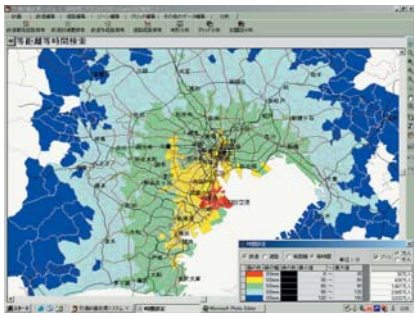
Gauge Change Train

See page 24.

When the gauge change train is put into service, direct train services between Shinkansen lines and conventional lines will be offered without having to convert the gauge of conventional lines.

Project survey

In our research department, a number of researcshes are conducted focusing on route selection, service operation planning, facility planning, demand forecasting, analysis of profitability and socio-economic effects, etc. We perform multi-level researches including rough studies in the design phase, and detailed studies in the commercialization phase, etc.



See pages 26 and 27.

Comprehensive technologies for railway construction

A railway is not built by a single piece of work; it requires a comprehensive set of multifaceted operations, such as surveys to determine the route, negotiations with the relevant authorities, land acquisition, and design and construction of railway structures. Also, a long period of time is required and enormous cost is involved. While seeking to reduce cost, JRTT is resolved to contribute to the swift construction of user-friendly railway lines by capitalizing on our abundant experience and comprehensive technology acquired in the course of our long-term engagement in railway construction projects nationwide for researches, planning, design and construction work, raising funds and negotiating with railway operators and local residents as a public group of general railway technical experts.

Cost reduction

By drawing on our wealth of technical achievements, we attempt to cut down on construction costs by proactively adopting economically efficient design and construction technologies, etc., and reduce the lifecycle cost by improving the quality of facilities.

Work period reduction

As JRTT has departments with every kind of expertise required for railway construction, cross-functional comprehensive process adjustments and swift construction work are possible. Consequently, railways are opened promptly and costs are reduced.

Technological development

Thanks to our achievements of technological developments in a number of fields including tunnels, bridges, etc., and the wide range of our design and construction techniques, we are constantly offering structures to meet every need by using the most advanced technology.

Simplified procedures

When JRTT is commissioned to design a project, the data, drawings, etc., to be submitted when applying for approval of construction work are significantly simplified (Preferential design approval procedure) (See the description with an asterisk below).

We construct railways to meet the needs by mobilizing comprehensive technologies.

Research and planning for railway construction

1 Research and planning for railway construction

We draw up a rational and efficient construction plan by capitalizing on our abundant experience and technology in railway construction to optimally determine the route and station locations, coordinate and negotiate with relevant authorities, acquire lands, design railway structures, and implement the construction work, etc.

* Preferential design approval procedure: Since JRTT is recognized to have high comprehensive technological capabilities, when we provide a railway operator with design work for their project, the operator is entitled to a simplified procedure for application for permission of railway construction (according to Article 14 of the Railway Business Act). Also, as JRTT is involved in both of the design and the construction works, the construction plan is drawn up with high accuracy. Consequently, the construction cost is dramatically reduced.

2 Fund procurement

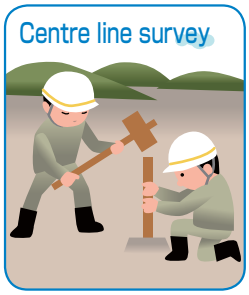
To implement railway construction work, massive amounts of money must be invested. As a highly reliable public body, we can procure construction funds from a variety of financial resources including private sector.

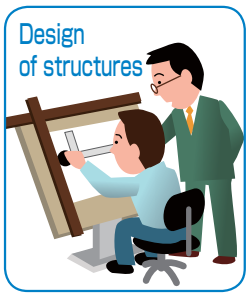
3 Implementation of construction work

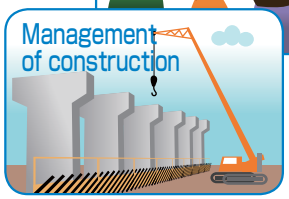
To implement the construction work, we provide explanatory meetings for local governments and residents, properly negotiate with them in various ways to obtain their understanding and cooperation, and proceed with construction work under proper and precise supervision by combining technologies from the civil engineering, machinery, electricity and archtectural departments.

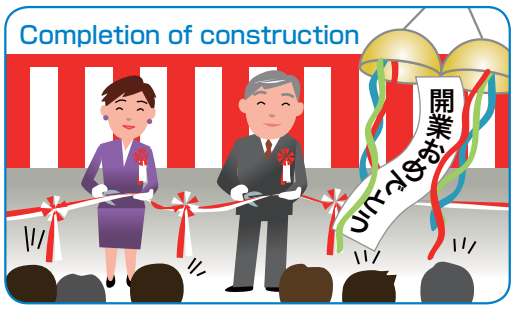
We also do our very best to conserve surrounding environment by taking appropriate action to mitigate noise and vibration during construction work, and ensure that all the parties concerned with construction work are committed to prevent accidents involving themselves as well as third persons.

Railway construction procedures







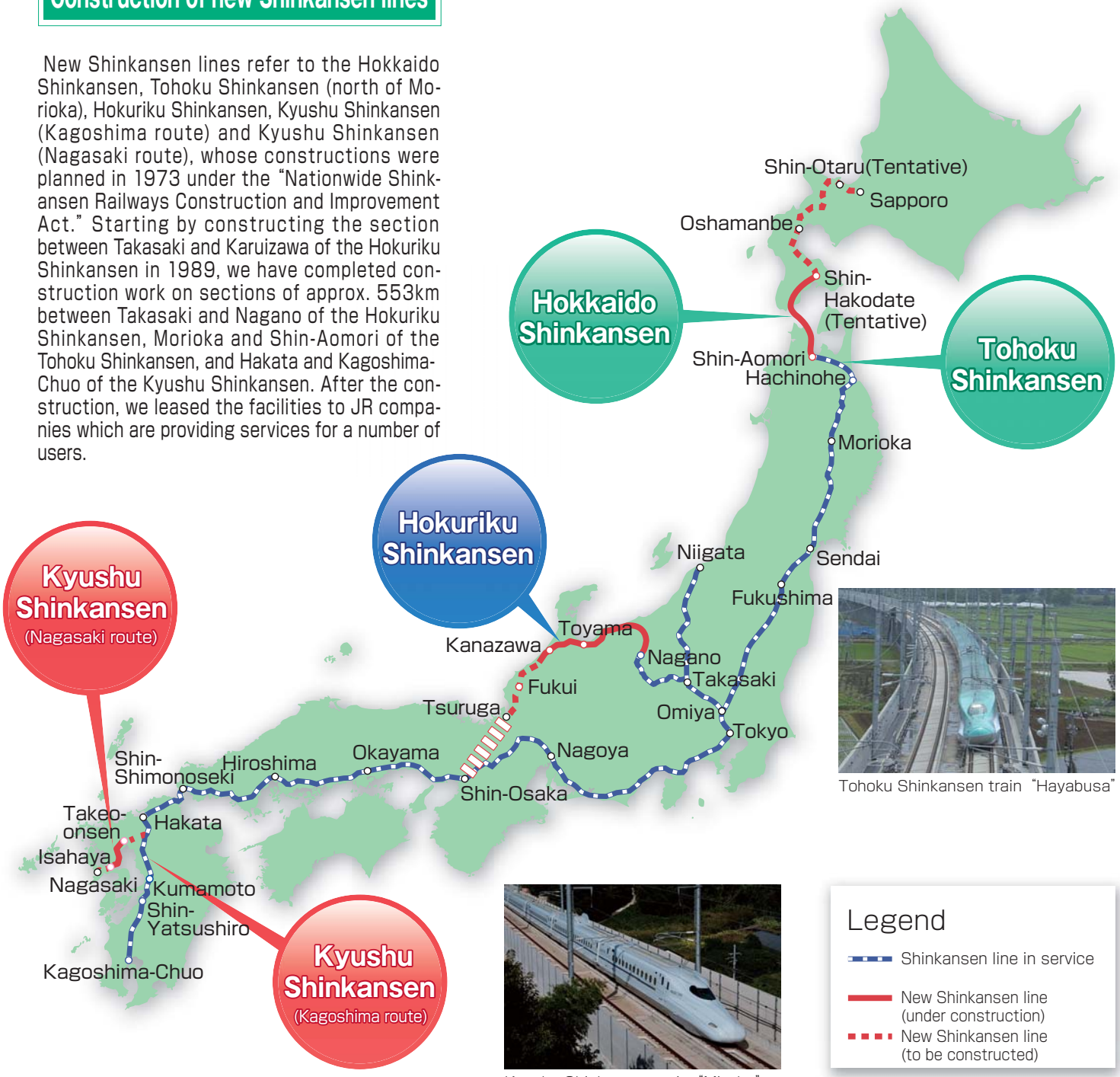


Explanatory meetings for local governments and residents	Explanatory meetings are held locally to ask for understanding and cooperation of residents with regard to on-site activities such as surveys.
Centre line survey	Centre pile driving, and vertical and horizontal surveys are conducted. Also, geological investigations are carried out as required for construction.
Discussions on design	A schematic design of structures is made, and the required site width is examined. Based on the results, we discuss the occupancy of rivers, roads, etc., intersecting the railway with relevant departments of the national government, local governments, etc.
Design of structures	After holding talks on design, the structures are designed.
Driving of site-width piles	To identify the extent of the site required for the project, the site is surveyed by driving piles to mark the site width.
Negotiations and acquisition of the land	The compensation standards set by the government, etc., are observed to ensure that proper compensations are paid for the site.
Awarding of contract	Construction work is awarded at a proper construction cost by reflecting the experience of construction.
Briefing sessions on construction work	Construction work procedures are specifically described.
Construction management	Technical guidance, management regarding safety, process and budget, and quality control are implemented in order to smoothly and economically proceed with the construction work.
Completion of construction	When the construction work is completed, the new line goes into service after necessary inspections and test runs are implemented.
Lease and transfer	Following the completion of the construction work, facilities are leased or transferred to the railway operator.

Construction of new Shinkansen lines

Construction of new Shinkansen lines

New Shinkansen lines refer to the Hokkaido Shinkansen, Tohoku Shinkansen (north of Morioka), Hokuriku Shinkansen, Kyushu Shinkansen (Kagoshima route) and Kyushu Shinkansen (Nagasaki route), whose constructions were planned in 1973 under the "Nationwide Shinkansen Railways Construction and Improvement Act." Starting by constructing the section between Takasaki and Karuizawa of the Hokuriku Shinkansen in 1989, we have completed construction work on sections of approx. 553km between Takasaki and Nagano of the Hokuriku Shinkansen, Morioka and Shin-Aomori of the Tohoku Shinkansen, and Hakata and Kagoshima-Chuo of the Kyushu Shinkansen. After the construction, we leased the facilities to JR companies which are providing services for a number of users.



Tohoku Shinkansen train "Hayabusa"

Kyushu Shinkansen train "Mizuho"

Legend

- Shinkansen line in service
- New Shinkansen line (under construction)
- New Shinkansen line (to be constructed)

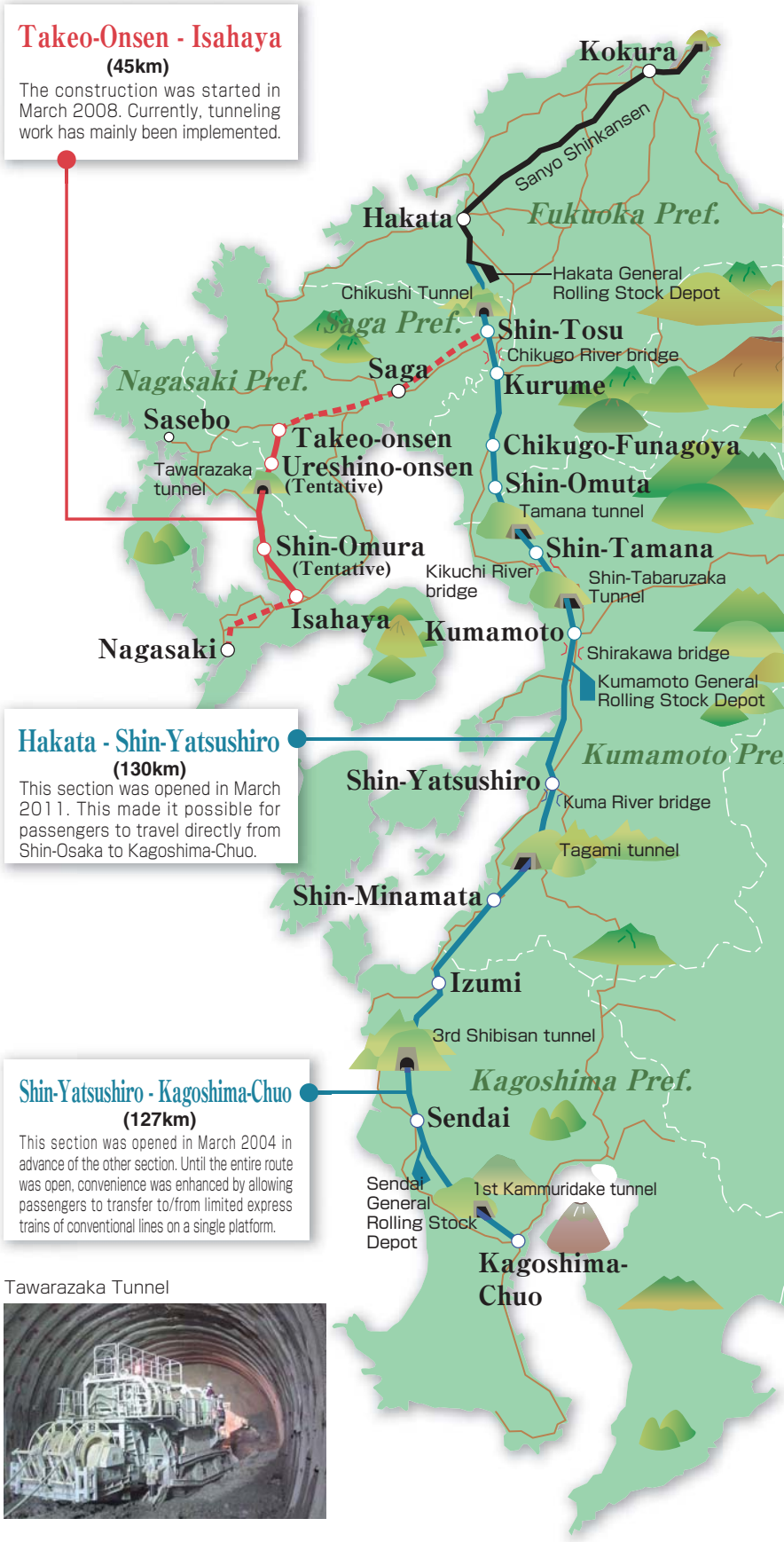
Kyushu Shinkansen

The Kyushu Shinkansen is composed of two sections: (1) is the Kagoshima route of about 257 km between Hakata and Kagoshima-Chuo, and (2) is the Nagasaki route running from Shin-Tosu to Nagasaki (about 117 km). On route (1), the section between Shin-Yatsushiro and Kagoshima-Chuo was opened in March 2004 in advance, and the other section between Hakata and Shin-Yatsushiro was opened in March 2011. Also, on route (2), the construction of the section between Takeo-Onsen and Isahaya started in March 2008.

Takeo-Onsen - Isahaya
(45km)
The construction was started in March 2008. Currently, tunneling work has mainly been implemented.

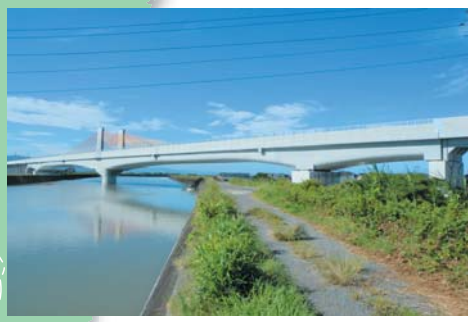
Hakata - Shin-Yatsushiro
(130km)
This section was opened in March 2011. This made it possible for passengers to travel directly from Shin-Osaka to Kagoshima-Chuo.

Shin-Yatsushiro - Kagoshima-Chuo
(127km)
This section was opened in March 2004 in advance of the other section. Until the entire route was open, convenience was enhanced by allowing passengers to transfer to/from limited express trains of conventional lines on a single platform.




Shin-Tosu Station


Matsubara Inter Section Bridge


Ono River Bridge

Tawarazaka Tunnel

Construction of new Shinkansen lines

Hokuriku Shinkansen

The Hokuriku Shinkansen runs for approx. 600km between Takasaki and Osaka. Currently, the construction of tracks, stations, etc., is in progress in addition to civil engineering work for extending the line of approx. 228km between Nagano and Kanazawa, and founding the Hakusan General Rolling Stock Depot (tentative name).

Also, construction of the 1km long viaduct at Fukui Station was completed at the end of FY 2008.

Jinzu River Bridge

Aerial view of the Kanazawa Station area

Viaduct at Fukui Station

4th Chikuma River Bridge

Hime River Bridge

Naoetsu
Niigata Pref.
Itoigawa
Hime River bridge
Shin-Oyashirazu tunnel
Mineyama tunnel
Joetsu (Tentative)
Joshin bypass Viaduct Bridge
Urasa
Shin-Shirakawa
Echigoyuzawa
Nasushiobara
Kurobe River Bridge
Shin-Takaoka (Tentative)
Shin-Kurobe (Tentative)
Iiyama tunnel
Iiyama
Jomokogen
Nagano Rolling Stock depot
5th Chikuma River bridge
1st Uozu tunnel
Toyama
Toyama Pref.
Yashiro Viaduct Bridge
Nagano
Joetsu Shinkansen
Tohoku Shinkansen
Gorigamine tunnel
Annaka-Haruna
Utsunomiya
Nagano Pref.
Usui Pass tunnel
Ueda
Komoro
Takasaki
Yokokawa
Oyama
Sakudaira
Karuizawa
Honjowaseda
Matsumoto
Kumagaya
Omiya
Ueno
Tokyo
Shinagawa
Shin-Yokohama
Nagoya
Shin-Fuji
Odawara
Mishima
Atami
Mikawa-Anjo
Shizuoka
Tokaido Shinkansen
Toyohashi
Kakegawa
Hamamatsu

Takasaki - Nagano
(117km)
This section was opened in Oct. 1997, and served as a means of mass transportation during the Nagano Olympics. Subsequently, this section has been continuing to attain favorable achievements.

Nagano - Kanazawa
(228km)
The construction is in progress, and is to be completed at the end of FY 2014.

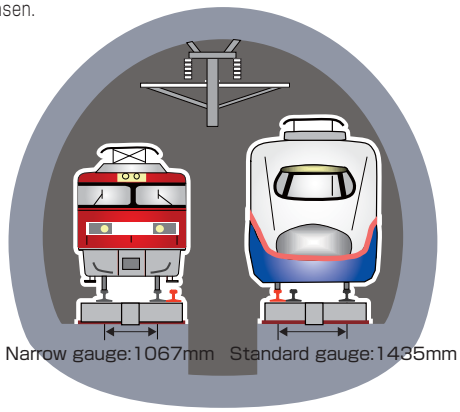
2nd Chikuma River Bridge

Construction of new Shinkansen lines

Sannai-Maruyama Over-road Bridge

Seikan Undersea Tunnel

The world's longest, the 53.9 km long Seikan Tunnel, was completed in 1988 and currently serves conventional limited express trains and freight trains.
The tunnel was designed and constructed to serve the Shinkansen, and will serve both conventional trains and Shinkansen trains in the future with some remodeling work that includes laying of a third rail to match the wider gauge of the Shinkansen.



Conceptual illustration of double serving

Tohoku and Hokkaido Shinkansen

As the section between Hachinohe and Shin-Aomori was opened in December 2010, the Tohoku Shinkansen running for approx. 675km between Tokyo and Shin-Aomori was completed.
The Hokkaido Shinkansen runs for approx. 360km between Shin-Aomori and Sapporo. Currently, track laying work as well as civil engineering work is in progress in preparation for opening the line.
Also, track laying and electrification work are in progress in the Seikan Tunnel section shared with the conventional line.

Shin-Aomori Station

Hakkoda Tunnel

Tsugaru Yomogita Tunnel, SENS machine

Hakodate General Rolling Stock Depot

Otaru
Shin-Otaru (Tentative)
Iwamizawa
Sapporo
Kutchan
New Chitose Airport
Tomakomai
Oshamambe
Muroran
Shin-Yakumo (Tentative)
Shin-Hakodate (Tentative)
Esashi
Shin-Moheji Tunnel
Hakodate General Rolling Stock Depot
Oshimatoubetsu Tunnel
Hakodate
Hokkaido
Kikonai

Shin-Aomori - Shin-Hakodate
(149km)
Construction work was started in April 2005, and is scheduled to be completed at the end of FY 2015.

Seikan Tunnel

Hachinohe - Shin-Aomori
(82km)
This section was opened in December 2010. The entire Tohoku Shinkansen line was put into service as the main artery of the Tohoku District.

Okutsugaru (Tentative)
Tsugaru Yomogita tunnel
Aomori Rolling Stock Depot
Aomori
Noheji
Shin-Aomori
Sannai-Maruyama Over-road Bridge
Hakkoda tunnel
Shichinohe-Towada

Hakkoda Tunnel
This 26.5 km long tunnel was broken through in February 2005. The tunnel is the world's longest single bored double track inland tunnel as of March 2011.

Aomori Pref.
Sanbongihara tunnel
Oirase River Bridge
Hirosaki
Hachinohe
3rd Mabuchi River Bridge
Kindaichi Tunnel
Ninohe
Noshiro
Iwate-Ichinohe Tunnel
Iwate Pref.
Iwate-Numakunai
5th Kitakami River Bridge
Akita Pref.
Akita
Morioka

Morioka - Hachinohe
(97km)
This section was opened in December 2002. As the Shinkansen line extended to Hachinohe, the range of travel from the Tokyo Metropolitan area was expanded.

In the Tohoku Shinkansen line, the section between Omiya and Morioka was opened in June 1982, and then extended to Tokyo.

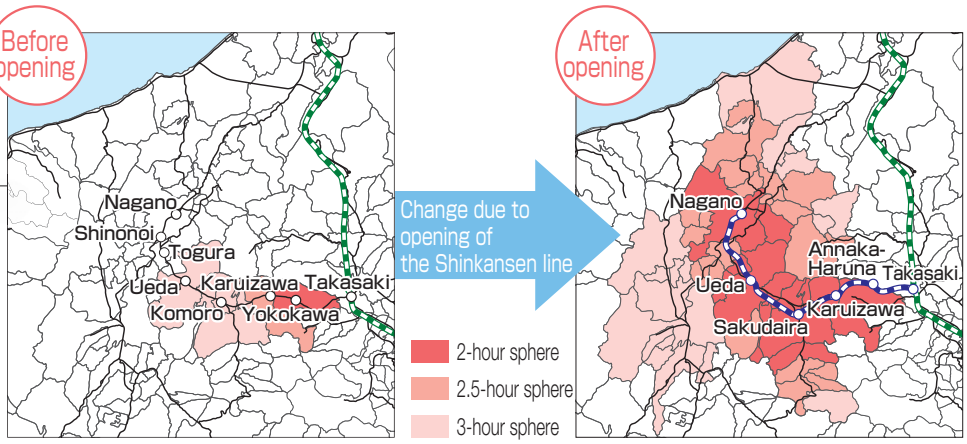
Effects due to opening of new Shinkansen lines

Hokuriku Shinkansen (Takasaki - Nagano)

Change in traveling time from each municipality to Tokyo

	Before opening	After opening
Within 2-hour sphere	60,000 people	920,000 people
Within 2.5-hour sphere	90,000 people	1,190,000 people
Within 3-hour sphere	440,000 people	1,970,000 people

(Note)
Cumulative total population : within 2.5-hour sphere = (2-hour sphere + 2.5-hour sphere)
Cumulative total population : within 3-hour sphere = (2-hour sphere + 2.5-hour sphere + 3-hour sphere)
(Data)
Population: The latest national census conducted before opening of the line. (In both cases (before opening and after opening), the findings of the national census conducted in 1995 were aggregated based on the municipality boundary as of January 2009).
Traveling time: The time spent for accessing a Shinkansen station from city halls or government offices of each municipality is taken into consideration based on the timetable (April 1997 issue for data before opening and October 1997 issue for data after opening), etc.

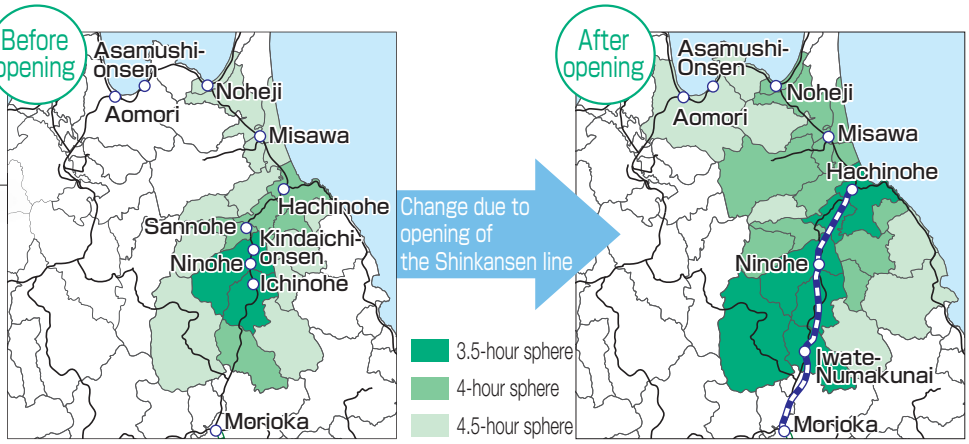


Tohoku Shinkansen (Morioka - Hachinohe)

Change in traveling time from each municipality to Tokyo

	Before opening	After opening
Within 3.5-hour sphere	50,000 people	370,000 people
Within 4-hour sphere	350,000 people	630,000 people
Within 4.5-hour sphere	570,000 people	1,060,000 people

(Note)
Cumulative total population : within 4-hour sphere = (3.5-hour sphere + 4-hour sphere)
Cumulative total population : within 4.5-hour sphere = (3.5-hour sphere + 4-hour sphere + 4.5-hour sphere)
(Data)
Population: The latest national census conducted before opening of the line. (In both cases (before opening and after opening), the findings of the national census conducted in 2000 were aggregated based on the municipality boundary as of January 2009).
Traveling time: The time spent for accessing a Shinkansen station from city halls or government offices of each municipality is taken into consideration based on the timetable (October 2002 issue for data before opening and December 2002 issue for data after opening), etc.

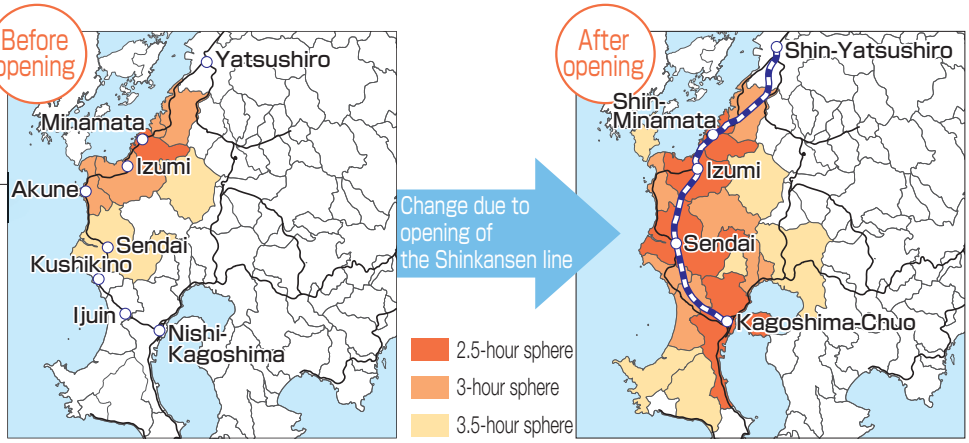


Kyushu Shinkansen (Shin-Yatsushiro - Kagoshima-Chuo)

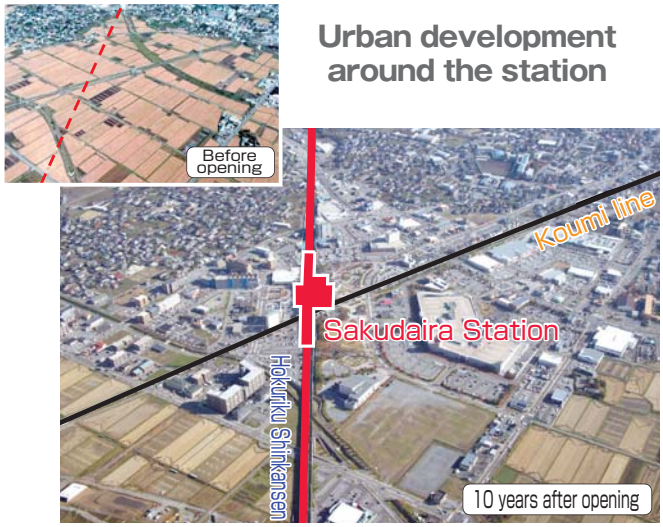
Change in traveling time from each municipality to Hakata

	Before opening	After opening
Within 2.5-hour sphere	30,000 people	800,000 people
Within 3-hour sphere	140,000 people	1,030,000 people
Within 3.5-hour sphere	280,000 people	1,290,000 people

(Note)
Cumulative total population : within 3-hour sphere = (2.5-hour sphere + 3-hour sphere)
Cumulative total population : within 3.5-hour sphere = (2.5-hour sphere + 3-hour sphere + 3.5-hour sphere)
(Note)
When the line was opened, Nishikagoshima Station was renamed Kagoshima-Chuo Station.
(Data)
Population: The latest national census conducted before opening of the line. (In both cases (before opening and after opening), the findings of the national census conducted in 2000 were aggregated based on the municipality boundary as of January 2009). (except for isolated island's population)
Traveling time: The time spent for accessing a Shinkansen station from city halls or government offices of each municipality is taken into consideration based on the timetable (December 2003 issue for data before opening and March 2004 issue for data after opening), etc.



Hokuriku Shinkansen (Takasaki - Nagano)



Sakudaira Station

Kyushu Shinkansen (Shin-Yatsushiro - Kagoshima-Chuo)

Bus pools and parking lots are being constructed around Shinkansen line stations so as to serve as hubs of the broad traffic network

Kagoshima-Chuo Station

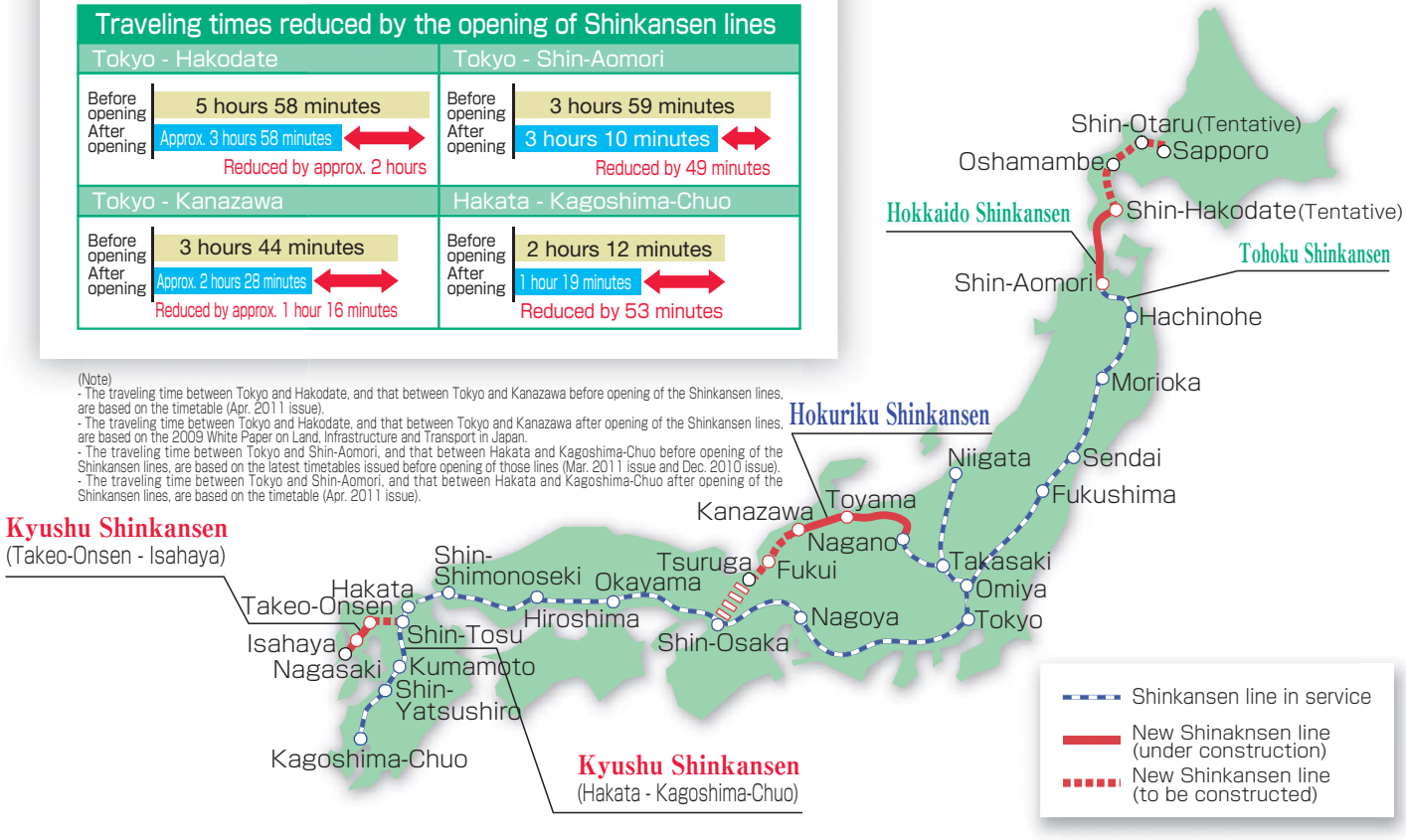
Shinkansen lines hereafter

Currently, construction of the Hokkaido Shinkansen (Shin-Aomori - Shin-Hakodate), Hokuriku Shinkansen (Nagano - Kanazawa) and Kyushu Shinkansen (Takeo-Onsen - Isahaya) are in progress.

Traveling times reduced by the opening of Shinkansen lines

Tokyo - Hakodate	Tokyo - Shin-Aomori
Before opening: 5 hours 58 minutes After opening: Approx. 3 hours 58 minutes Reduced by approx. 2 hours	Before opening: 3 hours 59 minutes After opening: 3 hours 10 minutes Reduced by 49 minutes
Tokyo - Kanazawa	**Hakata - Kagoshima-Chuo**
Before opening: 3 hours 44 minutes After opening: Approx. 2 hours 28 minutes Reduced by approx. 1 hour 16 minutes	Before opening: 2 hours 12 minutes After opening: 1 hour 19 minutes Reduced by 53 minutes

(Note)
- The traveling time between Tokyo and Hakodate, and that between Tokyo and Kanazawa before opening of the Shinkansen lines, are based on the timetable (Apr. 2011 issue).
- The traveling time between Tokyo and Hakodate, and that between Tokyo and Kanazawa after opening of the Shinkansen lines, are based on the 2009 White Paper on Land, Infrastructure and Transport in Japan.
- The traveling time between Tokyo and Shin-Aomori, and that between Hakata and Kagoshima-Chuo before opening of the Shinkansen lines, are based on the latest timetables issued before opening of those lines (Mar. 2011 issue and Dec. 2010 issue).
- The traveling time between Tokyo and Shin-Aomori, and that between Hakata and Kagoshima-Chuo after opening of the Shinkansen lines, are based on the timetable (Apr. 2011 issue).



Construction of urban railways

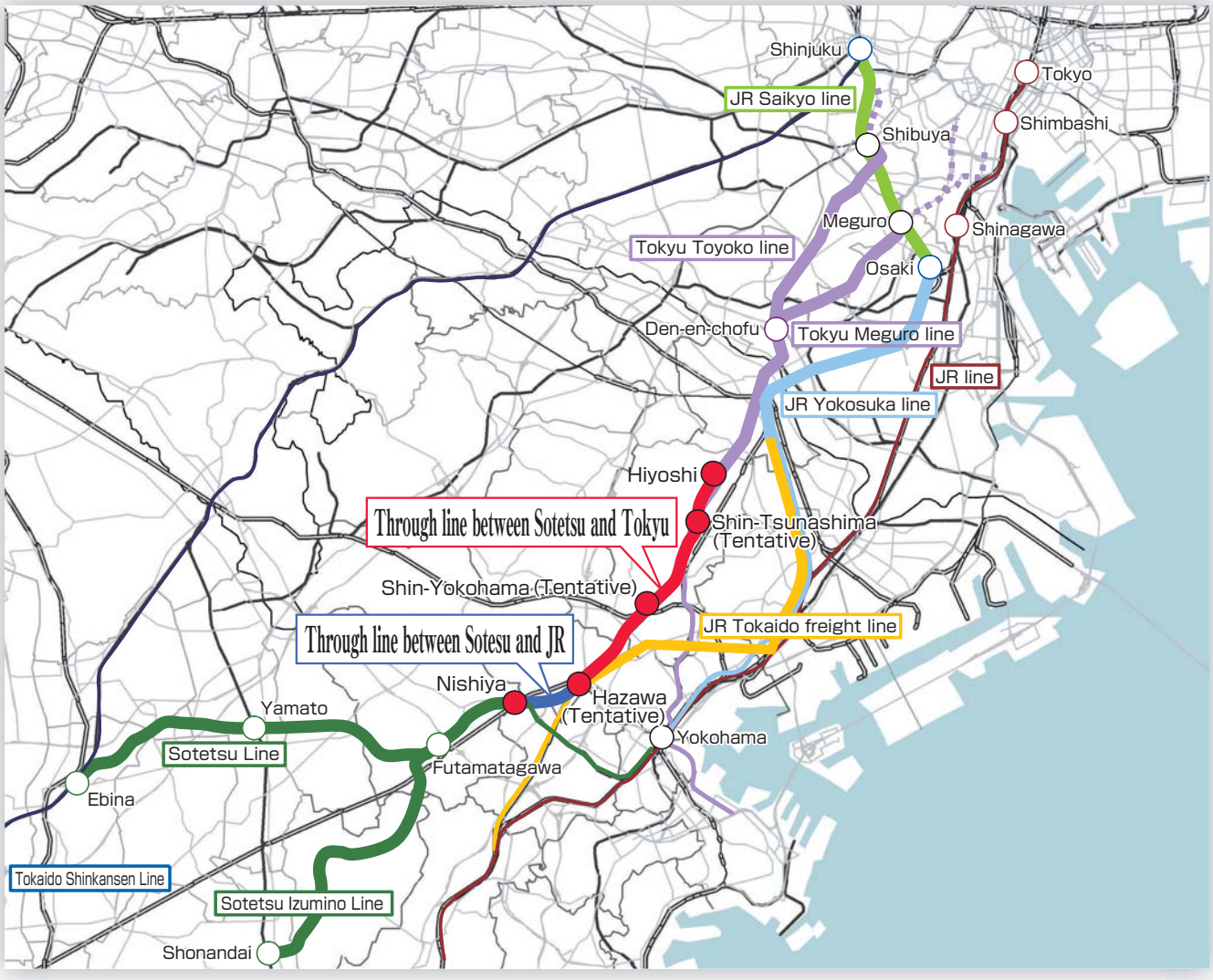
Through lines between the Sotetsu Line and the JR Line, and between the Sotetsu Line and the Tokyu Line

The through lines between the Sotetsu Line and the JR Line, and between the Sotetsu Line and the Tokyu Line, are the eastern Kanagawa lines under Recommendation No.18 by the Council for Transport Policy.

When these lines are opened and direct transport services are available, the central part of Kanagawa Prefecture (Ebina - Shonandai) and subcenter of Yokohama (Futamatagawa - Tsurugamine district) will be connected to Shinjuku or Shibuya without transfer, and the traveling time will be significantly reduced. Thus, these lines will make up a part of the wide metropolitan railway network. Also, accessibility to the Shinkansen line (Shin-Yokohama Station) will be enhanced.

The construction of these lines is the first project to improve rapidity under the "Act on Enhancement of Convenience of Urban Railways, etc.(Note)" regulating so-called vertical separation between infrastructure and operation, and certified as rapidity improvement plans in which JRTT takes the initiative for construction work, and Sotetsu and Tokyo are responsible for operating activities.

Railway map of the through lines between Sotetsu and JR, and between Sotetsu and Tokyu

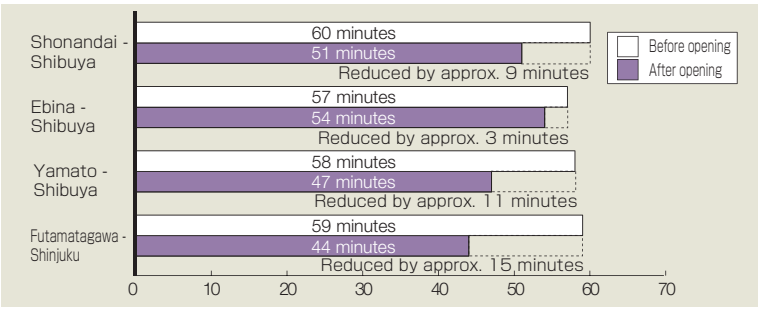


Through line between Sotetsu and JR

When the through line between Sotetsu and JR is opened, the central area of Tokyo will be connected to the Sotetsu line via the JR Tokaido freight line, JR Yokosuka line and JR Saikyo line.

Summary of the through line between Sotetsu and JR	
Section	Between Nishiya Station on the Sotetsu line and a site close to Yokohama Hazawa Station on the JR Tokaido freight line
Provider of construction work	JRTT
Operator	Sotetsu Holdings, Inc.
Length	Approx. 2.7km
Gauge	1,067mm
Operating frequency	About 4 trains per hour (during peak hours in the morning)
Scheduled completion	End of FY 2014

■Traveling times reduced by the opening of the through line between Sotetsu and JR (via JR Tokaido freight line and Shonan-Shinjuku line)

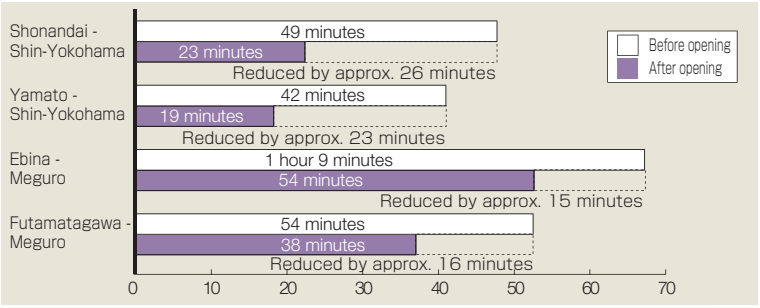


Through line between the Sotetsu line and the Tokyu line

When the through line between the Sotetsu line and the Tokyu line is opened, the central area of Tokyo will be accessible via the Sotetsu line connected to the Tokyu Toyoko line or Tokyu Meguro line.

Summary of the through line between the Sotetsu line and the Tokyu line	
Section	Between a site close to Yokohama Hazawa Station on the JR Tokaido freight line and Hiyoshi Station on the Tokyu Toyoko Line
Provider of construction work	JRTT
Operator	Sotetsu Holdings, Inc. and Tokyu Corporation
Length	Approx. 10.0km
Gauge	1,067mm
Operating frequency	About 10 to 14 trains per hour (during peak hours in the morning)
Scheduled completion	End of FY 2018

■Traveling times reduced by the opening of the through line between the Sotetsu line and the Tokyu line (via Tokyu Toyoko line and Tokyu Meguro line)



(Note)

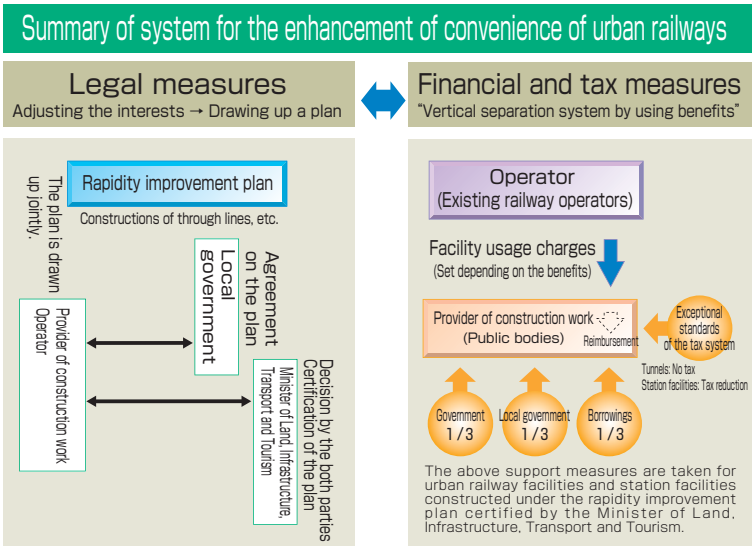
(Summary of the Act on Enhancement of Convenience of Urban Railways, etc.)

The Act on Enhancement of Convenience of Urban Railways, etc regulates new railway improvement measures aiming to efficiently use the existing urban railway facilities, improve rapidity and allow the station facilities to be used smoothly. Under this act, the so-called "vertical separation system (separation of infrastructure and operation)" is adopted to assign construction work to public bodies including semi-public sector companies, and operating activities to railway operators, etc.

If a project is certified by the Minister of Land, Infrastructure, Transport and Tourism in accordance with the procedure stipulated by this Act, the certified party is requested to draw up and submit a rapidity improvement plan. As the plan is certified by the Minister, approval for railway construction work is deemed to be obtained under the Railway Business Act.

Note that the project costs for the through lines between Sotetsu and JR, and between Sotetsu and Tokyu, will be borne by the government, local government (Kanagawa Prefecture and Yokohama City) and JRTT equally, while Sotetsu and Tokyu pay facility usage charges (set depending on the benefits) to the JRTT.

Summary of system for the enhancement of convenience of urban railways



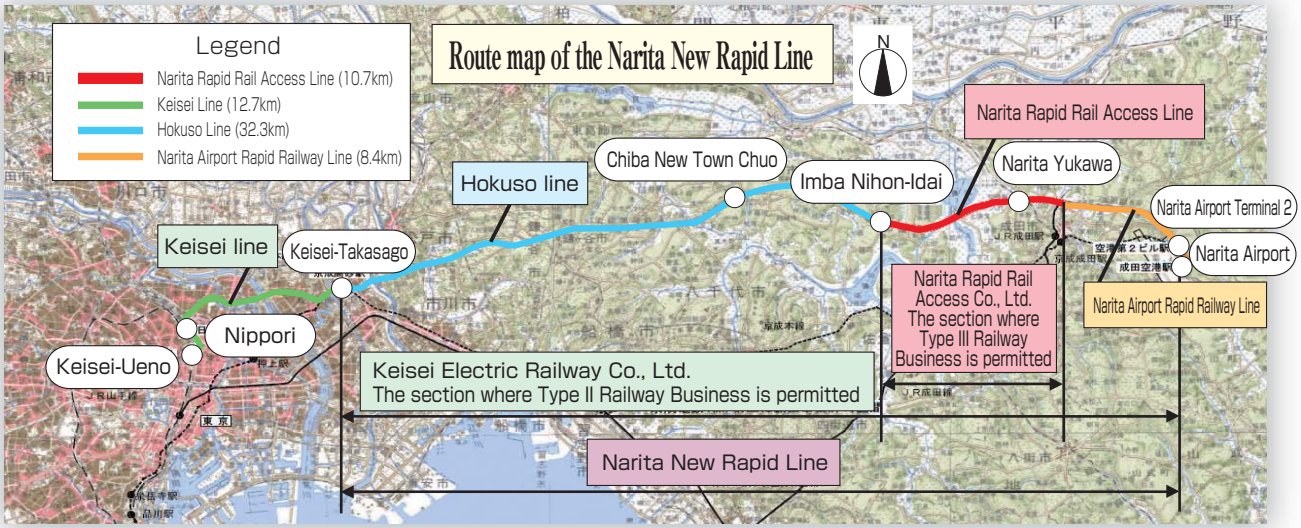
Construction of urban railways

Narita New Rapid Line (Open in Jul. 2010)

The Narita New Rapid Line, opened on Jul. 17, 2010, is an airport access line connecting the central Tokyo with Narita International Airport, which is the gateway to Japan.

This line runs for 51.4km, comprising an improved section (32.3km) between Keisei Takasago (Keisei Line) and Imba Nihon-Idai (Hokuso Line) (Max. speed: 130km/h), a newly constructed section (10.7km) between Imba Nihon-Idai and Tsuchiya, and an improved section (8.4km) between Tsuchiya and Narita Airport (Narita Airport Rapid Railway Line) (Max. speed: 160km/h).

Since it opened, the traveling time between the central Tokyo and Narita Airport is now 15 minutes shorter than the conventional route via the Keisei Line (by the fastest train between Nippori and the Airport Terminal 2). Also, this line contributes to improved accessibility to the northwestern part of Chiba Prefecture and enhancement of the cooperation between Narita City and Chiba New Town (the new housing development in the northern Chiba Prefecture).



(Source: Data from the website of Keisei Electric Railway Co., Ltd.)

(Types of railway business)

- Type I Railway Business
  Railway business aiming to transport passengers and feight by train except Type II Railway Business
- Type II Railway Business
  Railway business aiming to transport passengers and freight by train through use of another party's railways (including railways transferred from another party who constructed railways)
- Type III Railway Business
  Railway business aiming to develop railways to be transferred to the party engaging in Type I Railway Business, or railway business aiming to develop railways to be exclusively used by party engaging in Type II Railway Business

Narita Yukawa Station

A Skyliner train running through the Yashiro viaduct

The No. 38 turnout developed by applying a technology for the Shinkansen for trains running at 160km/h (See p.32)

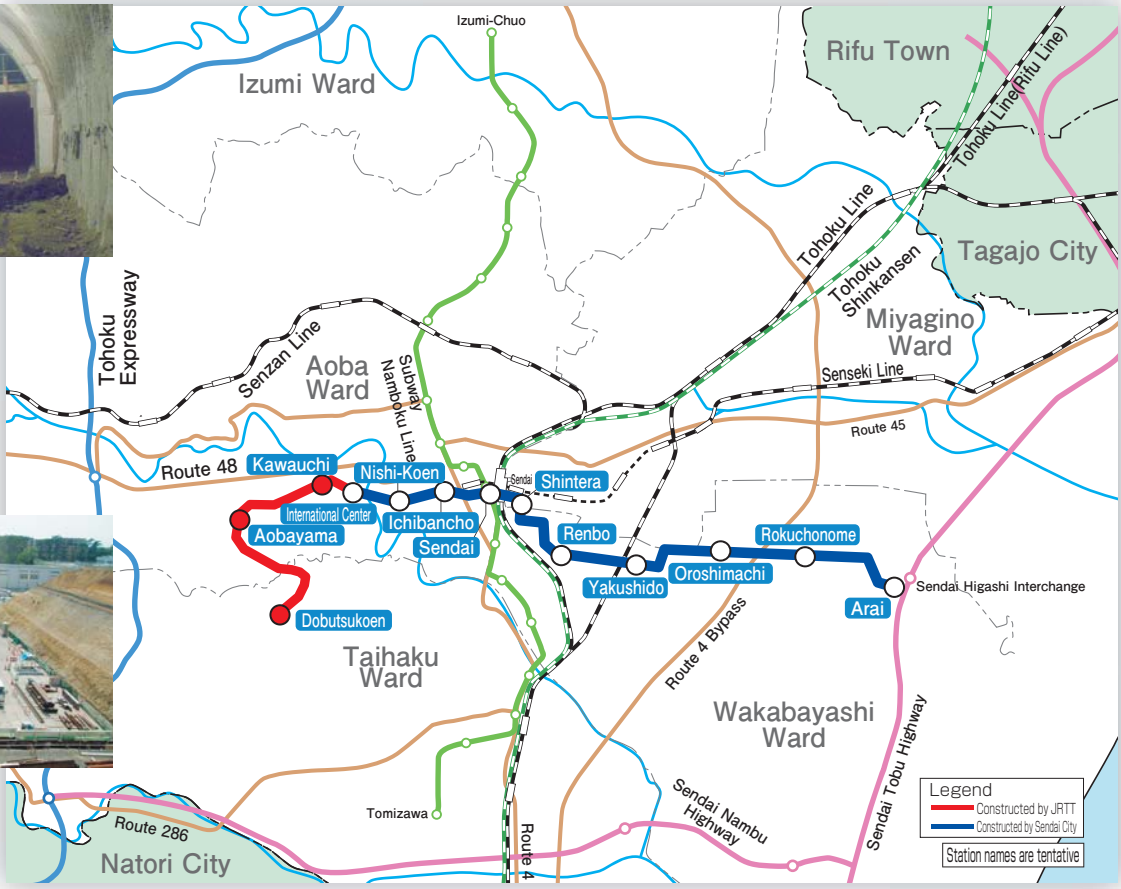
Sendai Subway Tozai Line

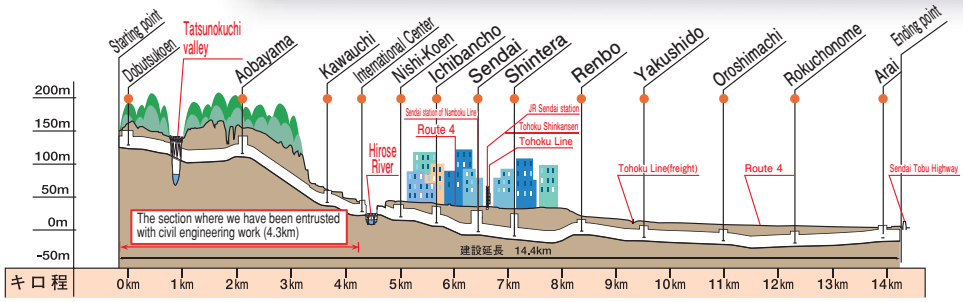
The Tozai Line, serving as the main traffic axis by connecting the eastern and western parts of Sendai City, runs for approx. 14km from southwestern the area near the Yagiyama Zoological Park to the area near the Sendai Higashi Interchange of the Sendai Tobu Highway via the central area near Sendai Station.

Of this project, JRTT was commissioned to perform civil engineering work in the section of approx. 4.3km from the starting point, "Dobutsukoen Station." The work is being carried out to mainly construct a tunnel structure giving extra consideration to the historical and cultural monuments of the Sendai Castle ruins and the natural environment of Aobayama.

Tunnel construction work arriving at Aobayama Station

Dobutsukoen Station





Effects of opening of the line

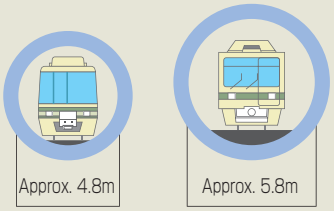
By connecting Sendai Station and Dobutsukoen Station in approx. 13 minutes, and Sendai Station and Arai Station in approx. 15 minutes, convenience and punctuality are significantly improved in comparison with the bus line.

Bus line (Dobutsukoen - Sendai Station)	32 minutes (during peak hours)	
Tozai Line (Dobutsukoen Station- Sendai Station)	13 minutes	Reduced by 19 minutes
Bus line (Arai - Sendai Station)	31 minutes (during peak hours)	
Tozai line (Arai Station - Sendai Station)	15 minutes	Reduced by 16 minutes

(Maglev subway)

The train cars are equipped with the maglev system, which contributes to the reduction of construction and operating costs, etc., and is able to handle heavy slopes.

Tunnel cross-section ratio: 6:10



(Source: Website of Sendai City Transportation Bureau)

Construction of urban railways

Aichi Loop Line

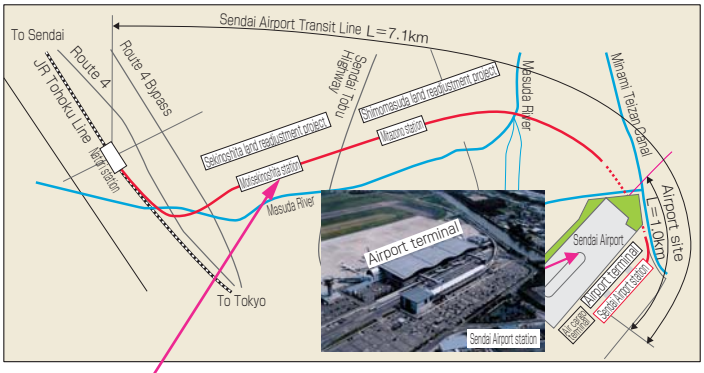
As part of measures for alleviating traffic jams and preserving the natural environment in Toyota City, JRTT was commissioned to conduct double tracking construction work in the section between Mikawa-Toyota and Shin-Toyota (3.6km) of the Aichi Loop Line with the aim of encouraging people commuting by car to use trains to enhance railway transport capacity, and the section was brought into service on January 27, 2008. As a result, the frequency of trains was increased between Shin-Toyota Station located in the central area of Toyota City and Mikawa-Toyota Station located close to the Honsha plant of Toyota Motor Corporation, and shuttle trains are in service during peak hours in the morning.
Also, in 2007, JRTT was commissioned to perform renovation work of the Morishita viaduct as part of the urban planning and road improvement project promoted by Aichi Prefecture. The viaduct was brought into service in August 2010, while the construction work was completed in November 2010.

Morishita viaduct

Passengers taking a shuttle train at Shin-Toyota station

Sendai Airport Transit Line (Opened in March 2007)

Since its opening on March 18, 2007, the Sendai Airport Transit Line has been serving as an access line connecting Sendai Airport to the central area of Sendai. This line is a single-track line diverging from the JR Tohoku line at Natori Station and runs for 7.1km to Sendai Airport Station. This line has been significantly contributing to the development of the new town known as "Rinku Town" around two intermediate stations, while dramatically enhancing convenience for users of the airport.



Traveling time reduction [Sendai Station - Sendai Airport]

●By road (bus or car)

Approx. 40 minutes

●By using the Sendai Airport Transit Line

Local 25 minutes
Rapid 17 minutes

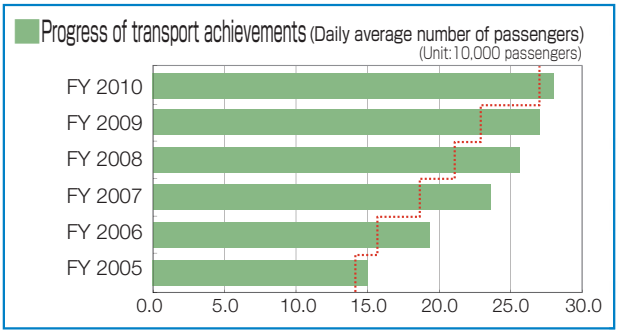
(Source: Corporate brochure of Sendai Airport Transit Co., Ltd.)

Aeon Mall Natori Airy

Convenience and punctuality have been significantly improved by achieving the fastest traveling time of 17 minutes between JR Sendai Station and Sendai Airport Station (in the case of rapid trains), and shortening traveling time by slightly more than 20 minutes in comparison with buses.
Also, a great cost reduction and construction period reduction were achieved.

Tsukuba Express Line (Open in August 2005)

The Tsukuba Express Line, opened on August 24, 2005, is a line which runs for approx. 58km with its trains travelling between Akihabara and Tsukuba Science City at the highest speed of 130km/h for 45 minutes. When this line was opened, the traffic network in the northeast of the Tokyo Metropolitan area became more convenient and the JR Johban Line became less crowded, contributing to a comfortable environment for commuting to offices and schools.
Thanks to the excellent rapidity and convenience of this line, the construction of residents is increasing and commercial facilities are being opened along the railway line, and the number of train users has grown 1.9 times in 5 years after opening.



* The red lines refer to the estimated number of passengers.
Source: Document issued by Metropolitan Intercity Railway Company

Akihabara Station during commuting hours

Large-scale commercial facilities were opened near Kashiwanoha-campus Station

Area around Miraidaira Station where the construction of residences is in progress

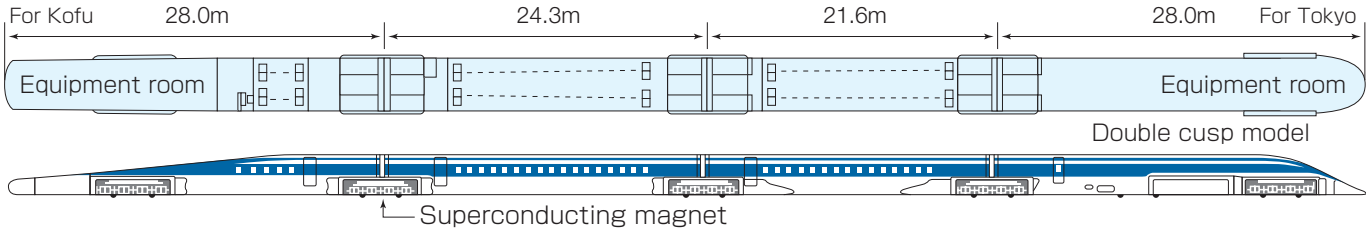
Yamanashi Maglev Test Line

Summary of development history of the superconducting magnetically levitated transportation system

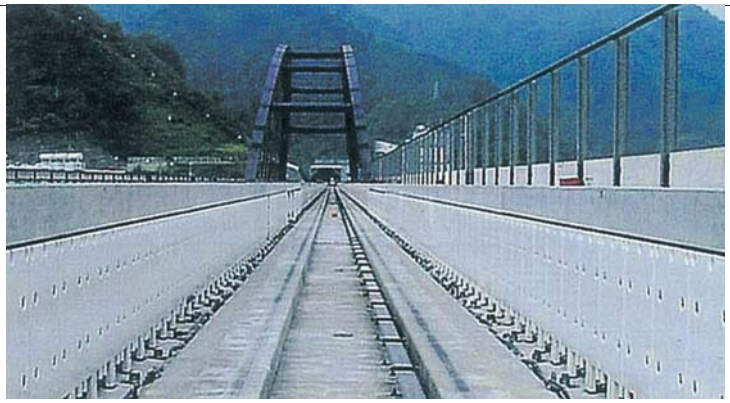
FY 1962	A study of the linear motor system was started.
FY 1972	Successful test run of maglev train
FY 1990	The basic plan for the Yamanashi Maglev Test Line Technical Development and its construction plan were approved by the Minister of Transport.
FY 1997	A test run was started in the priority section (18.4km) of the entire Yamanashi Maglev Test Line (42.8 km).
FY 2003	Successful manned test run at a speed of 581 km/hr
FY 2004	Successful test of two trains passing each other at a relative speed of 1026 km/h
FY 2005	Test runs with cars equipped with high-temperature superconducting magnets started to evaluate feasibility.
FY 2006	The Committee to Evaluate the Technical Feasibility of the Maglev System of MLIT advised that any technology for commercialization should be developed by 2016 for an ultrahigh speed mass transport system with a certain degree of competitiveness over other public transportation means.
FY 2007	In anticipation of the experiment to be conducted over the entire Yamanashi Maglev Test Line (42.8km), the basic plan for technology development in the section (24.4km) excluding the priority section and its construction plan were approved by the Minister of Land, Infrastructure, Transport and Tourism.
FY 2008	Extension work on the remaining section of the Yamanashi Maglev Test Line was started.
FY 2009	The Committee to Evaluate the Technical Feasibility of Maglev System of MLIT stated that the possibility of technologies for commercialization as the ultrahigh speed mass transportation mode is now a reality.

Yamanashi Maglev Test Line

The superconducting magnetically leviated transportation system (magrev train) is an innovative train car catching global attention as the train of the 21st century. Currently, a variety of experiments are being conducted by Central Japan Railway Company and Railway Technical Research Institute in an effort to solve the issues concerning long-term durability, economic efficiency, etc., by making a pledge to realize our dream, that is, one-hour travel between Tokyo and Osaka at 500km/h.



Test run of two maglev trains passing each other



Guideway

JRTT was entrusted with construction work for the Yamanashi Maglev Test Line by Central Japan Railway Company and Railway Technical Research Institute, and successfully completed construction work on the priority section. Since 2007, JRTT has been engaged in the construction of the remaining section.

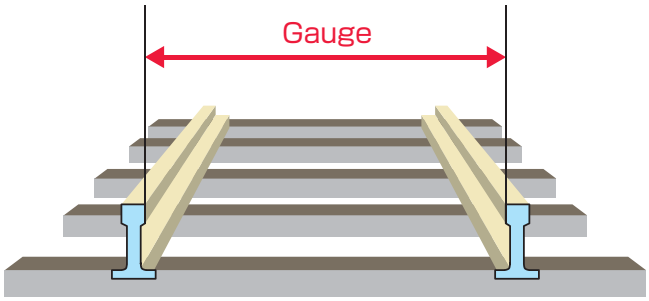
Gauge change train

Gauge change train

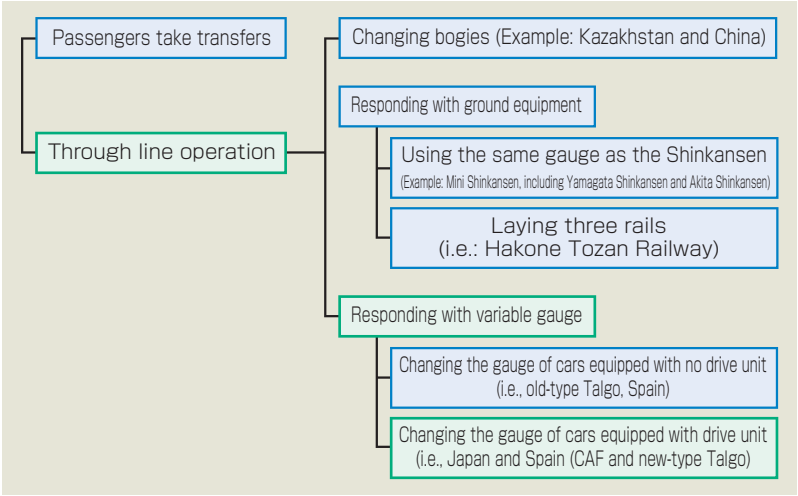
GCTs are designed to automatically change the distance between the wheels on both sides to match the size of the track gauge. If this type of train is put into practical use, direct train services between Shinkansen lines and conventional lines will be available and the inconvenience of transfers will be eliminated, resulting in a significant improvement of services for regions which do not directly benefit from the favorable effects of Shinkansen lines.

Gauges

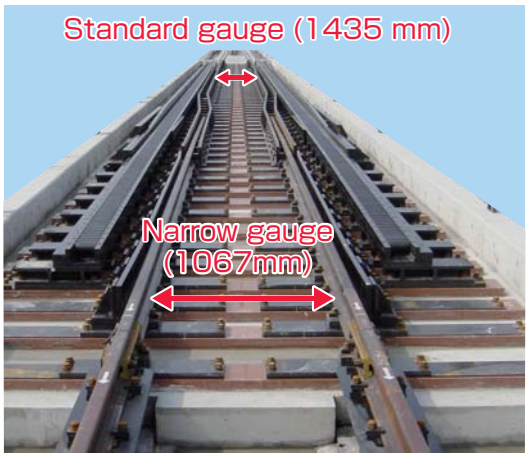
Conventional JR lines	1067mm
Tobu lines, Meitetsu lines, etc.	1067mm
Keio lines, Toei Subway Shinjuku Line	1372mm
JR Shinkansen lines	1435mm
Keikyu line, Hanshin Electric Railway lines	1435mm
France, Germany, Spain (high speed lines), etc.	1435mm
Russia, etc.	1520mm
Portugal and Spain (conventional lines)	1668mm



Through line operation between sections with different gauge



Gauge conversion equipment



Summary of development history

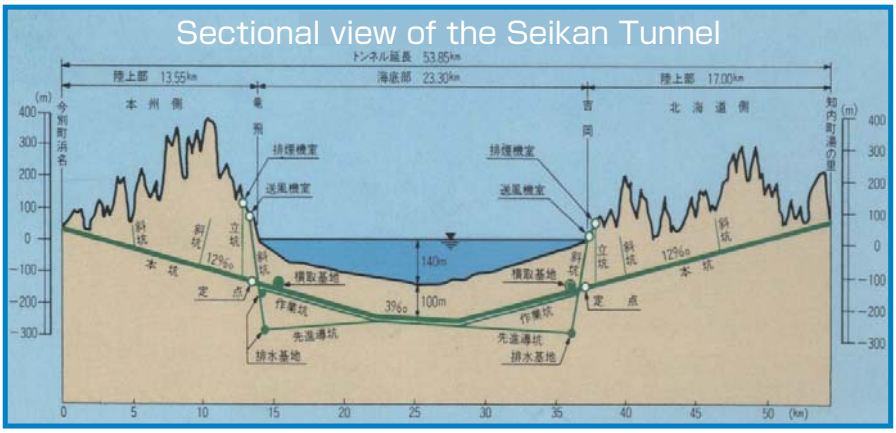
FY 1997 to 1998	The prototype (first testing car) was developed.
FY 1999 to 2000	Rapid test runs were conducted on the test line in Pueblo, US
FY 2001 to 2003	Domestic test runs (on conventional lines), and gauge conversion tests, etc., were conducted.
FY 2004 to 2006	Test runs were conducted on the Nippo Line (conventional line) and Sanyo Shinkansen, and new cars were designed and manufactured.
FY 2007 to 2008	Confirmation test runs of the new cars were conducted, and test runs were conducted on the Nippo Line (conventional line).
FY 2009 to 2010	Gauge conversion tests, through line tests between the Shinkansen and conventional lines, and test runs on the Kyushu Shinkansen, etc., were conducted.
FY 2011 onwards	Test runs were conducted on the Yosan Line (conventional line).

Reflecting the past development results and the test run data, we continue technological development including new-type bogies in order to develop trains combining the opposite technologies that can run at high speed on the Shinkansen lines and smoothly respond to frequent curves of conventional lines.

Seikan Tunnel

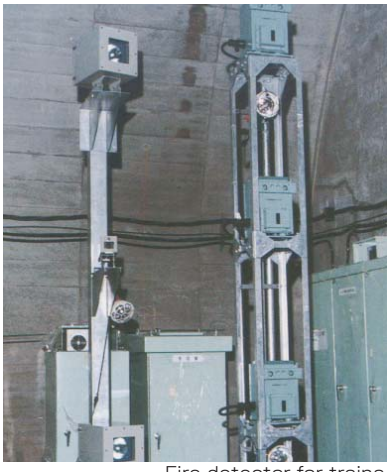
1. Summary

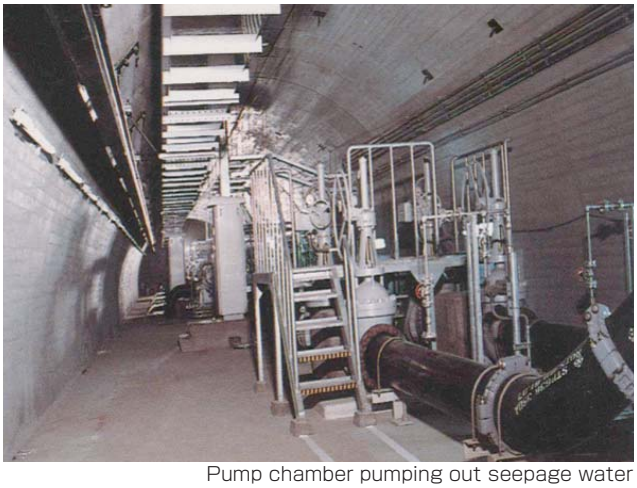
In the wake of the world's second worst catastrophe in the history of marine accidents involving a Japanese train ferry called "Toya Maru" which sank in the Tsugaru Strait during a raging typhoon in 1954, the plan of constructing a tunnel was drawn up. However, a huge amount of time was spent, and there were a number of unprecedented challenges and difficulties to overcome until completion of work.
Especially, during the course of undersea drilling, four major inundation accidents occurred, which led to the submergence of the tunnel. Nevertheless, after many years of strenuous efforts made by the persons involved, the tunnel finally broke through in 1988. Also, innovative technologies developed for this tunnel significantly contributed to the subsequent advancement of excavation methods used for constructing undersea tunnels, mountain tunnels and urban tunnels.
As you know, the Seikan Tunnel was constructed as a large-scale project of the century which took five decades. Now, new history is about to be made through efforts to open the Hokkaido Shinkansen Line extending to Shin-Hakodate across the Tsugaru Strait.




Excavation work on the Seikan Tunnel

2. Renovation work


Fire detector for trains


Pump chamber pumping out seepage water

■ Summary

The Seikan Tunnel has facilities for the operation of trains, and disaster prevention equipment required for assuring the safety of the tunnel and railway transportation.
As these facilities have deteriorated over time, renovation work was planned to be conducted from 1999 onwards with the aim of retaining function of the tunnel based on the findings of surveys conducted in the 10th year after its opening.
So far, the water discharge equipment including pumps, etc., and the fire prevention facilities including fire detectors, etc., located within the tunnel have been renovated.

Project surveys

Surveys conducted by JRTT

JRTT is conducting a wide variety of surveys commissioned by local governments or railway operators, etc., and government-financed surveys. By capitalizing on our abundant experience, we can conduct all kinds of surveys from the design phase to the commercialization phase.

Appropriate survey backed up by reliable technological capability

We carry out appropriate technical reviews and offer suggestions based on our rich knowledge and experience in railway construction.

Surveys conducted in accordance with an appropriate scheme

By capitalizing on our wide variety of experience in surveys, we can undertake technical reviews in accordance with an appropriate scheme, and offer suggestions.

Surveys conducted in a neutral stance

As a public body, we carry out highly objective and reliable surveys.

Finely-tuned surveys in consideration of local situations

JRTT has local offices covering the entire country, and thus can provide appropriate and timely surveys and support that matches local characteristics.

A general project survey flow

Identifying needs, etc.
- Identifying needs for railway development, and being aware of the plans drawn up by the national government and local governments

Conducting basic surveys
- Investigating and clarifying current transport situations, conditions, etc.
- Identifying the significance, necessity and urgency of railways
- Roughly understanding transport demand
- Examining the scheme to be applied

Rough study of the route
- Investigating and clarifying route study conditions, and comparing several possible routes
- Estimating transport demand, and studying an operation plan
- Roughly calculating the project cost

Determining the outline of the route
- Studying business feasibility, and evaluating socioeconomic effects
- Determining an outline of the route, station locations, rolling stock depot locations, etc.

Determining commercialization
- Determining the scheme to be applied
- Determining operators, and the fund procurement procedure

Drawing up a construction plan
- Conducting geological investigations and surveys, and studying design conditions
- Roughly designing structures, etc., estimating the construction cost, and implementing the procedure for obtaining business permission, etc.
- Designing an alignment, and examining structure types and models
- Negotiating with the parties concerned, evaluating environmental impacts, and implementing the procedure for determining an urban plan, etc.

Starting the construction work

* JRTT will provide support in terms of the above items.

Traffic planning support system "GRAPE (GIS for Railway Project Evaluation)"

GIS for Railways Project Evaluation

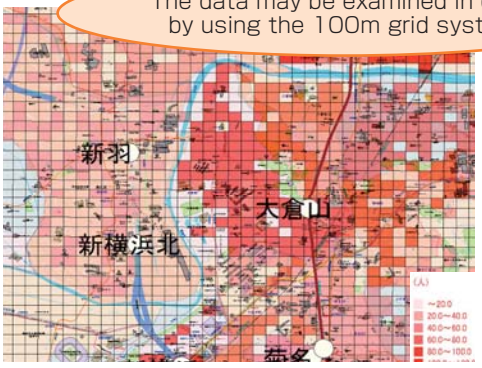
GRAPE is a new system to support the formulation of a traffic plan focused on railways. GRAPE enables efficient, visually understandable studies and analyses of high precision to match the actual status of user behavior.

Basic surveys and present data analysis

A variety of data is displayed in an integrated manner, and analyzed.

Air photographs, railway maps and stations are displayed in a superimposed manner.

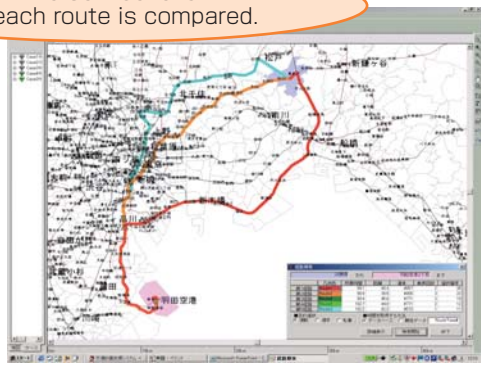
The data may be examined in detail by using the 100m grid system.



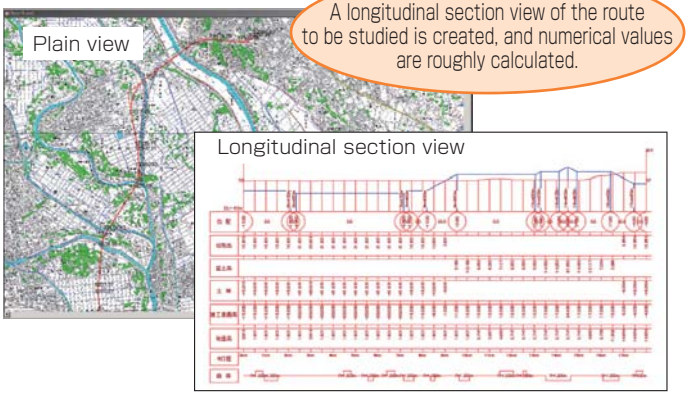
The population distribution is displayed by using the 100m grid system.

Rough study of route and study of alternative route

The service level of each route is compared.

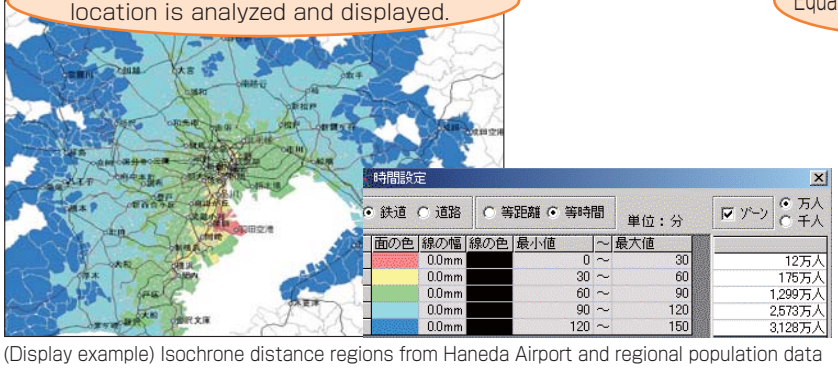


A longitudinal section view of the route to be studied is created, and numerical values are roughly calculated.



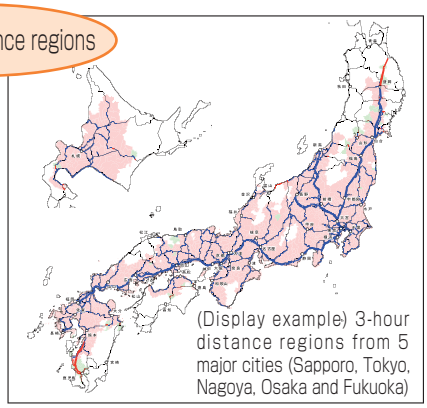
Project evaluation

The convenience from an arbitrary location is analyzed and displayed.



(Display example) Isochrone distance regions from Haneda Airport and regional population data

Equal-time distance regions



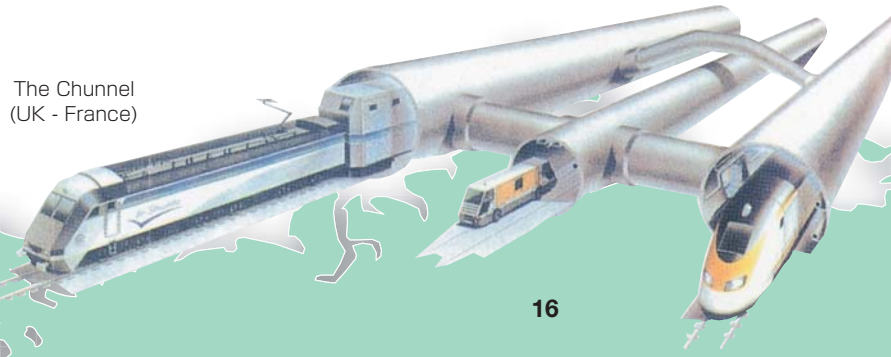
(Display example) 3-hour distance regions from 5 major cities (Sapporo, Tokyo, Nagoya, Osaka and Fukuoka)

Overseas technical cooperation

Countries and regions to which we offer technical cooperation

By making full use of the comprehensive technical capabilities and experience we gained in the course of construction work for the Seikan Tunnel, Joetsu, Hokuriku, Tohoku and Kyushu Shinkansen lines, and urban railways, etc., we are proactively offering technical cooperation by sending experts overseas in response to requests from the Ministry of Land, Infrastructure, Transport and Tourism (on a long and short-term basis), and accepting trainees from overseas. As of the end of March, 2011, we have offered technical cooperation to 64 countries and regions, and sent as many as 1,939 experts in total. Our overseas technical cooperation covers a variety of fields including surveys of business feasibility, construction planning, design, and construction work related to a new railway or renovation.

A tunneling shield machine made in Japan
(This machine significantly contributed to the construction of the Chunnel.)



The Chunnel
(UK - France)

Europe and CIS countries

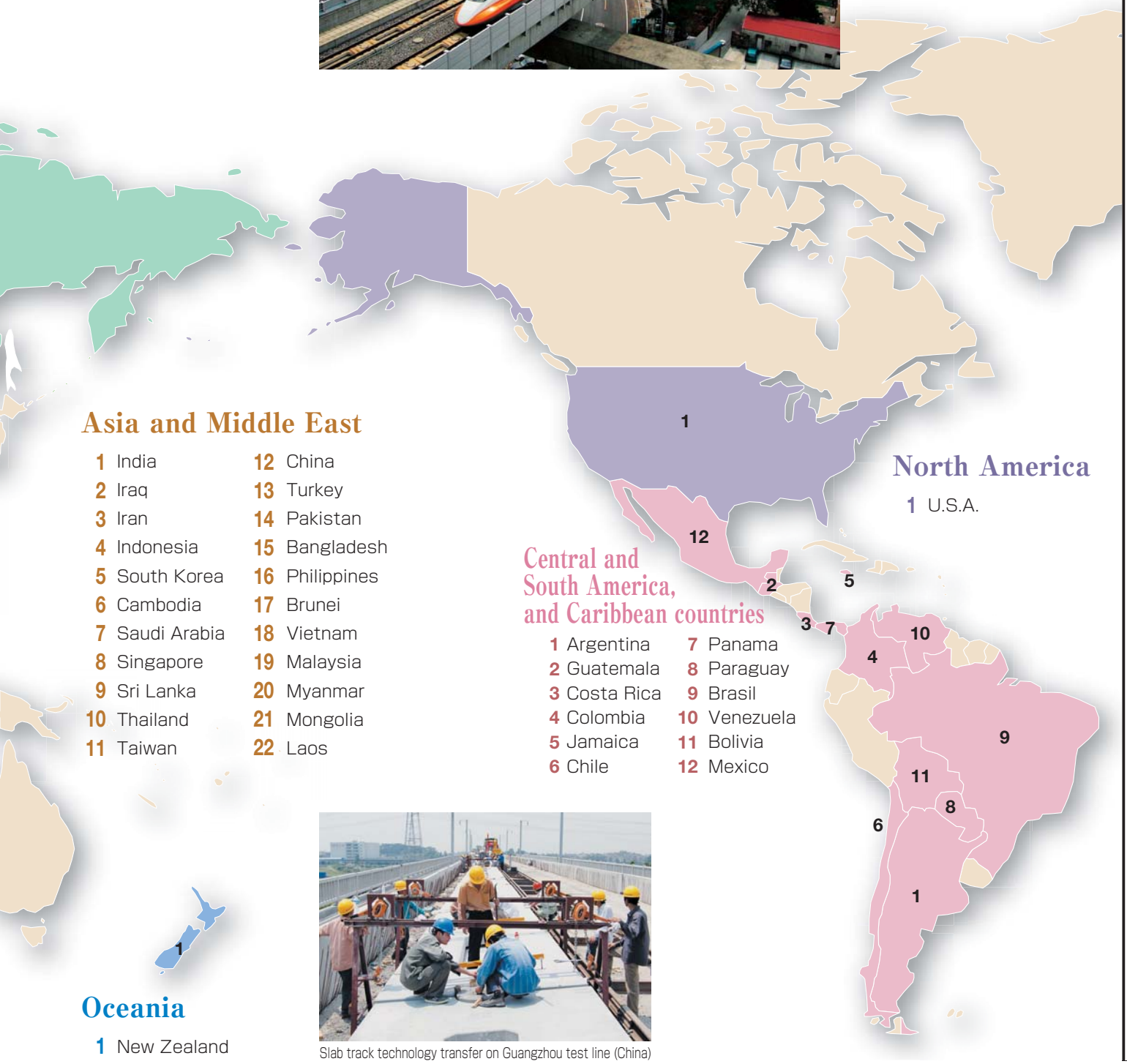
1 UK
2 Italy
3 Ukraine
4 Uzbekistan
5 Austria
6 The Netherlands
7 Kazakhstan
8 Spain
9 Germany
10 Turkmenistan
11 Finland
12 France
13 Bulgaria
14 Poland
15 Portugal
16 Russia

Africa

1 Uganda
2 Egypt
3 Ghana
4 Kenya
5 Democratic Republic of the Congo
6 Zambia
7 Sudan
8 Tanzania
9 Tunisia
10 South Africa
11 Mozambique
12 Morocco

Jakarta Metropolitan Railway (Indonesia)

High speed rail between Taipei and Kaohsiung (Taiwan)



Asia and Middle East

1 India
2 Iraq
3 Iran
4 Indonesia
5 South Korea
6 Cambodia
7 Saudi Arabia
8 Singapore
9 Sri Lanka
10 Thailand
11 Taiwan
12 China
13 Turkey
14 Pakistan
15 Bangladesh
16 Philippines
17 Brunei
18 Vietnam
19 Malaysia
20 Myanmar
21 Mongolia
22 Laos

North America

1 U.S.A.

Central and South America, and Caribbean countries

1 Argentina
2 Guatemala
3 Costa Rica
4 Colombia
5 Jamaica
6 Chile
7 Panama
8 Paraguay
9 Brasil
10 Venezuela
11 Bolivia
12 Mexico

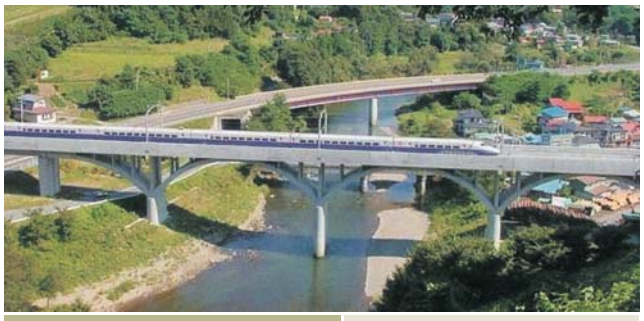
Oceania

1 New Zealand

Slab track technology transfer on Guangzhou test line (China)

Railway construction technologies

Bridge construction technologies

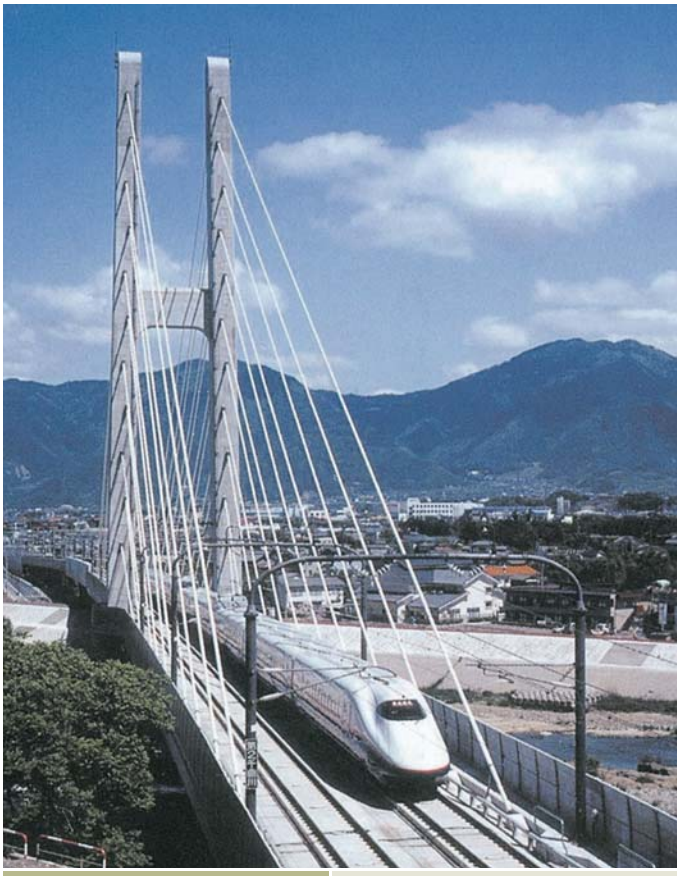


3rd
Mabechi River Bridge, Tohoku Shinkansen

Adoption of a five-span continuous reinforced concrete arch bridge created an elegant appearance that harmoniously matches the surrounding landscape.

Tone River Bridge, Tsukuba Express

This is a seven-span continuous through truss bridge. Continuous through truss and light-weight concrete deck slabs achieved weight reduction of the bridge and a slender appearance, thereby harmoniously matching the surrounding environment.



2nd
Chikuma River Bridge, Hokuriku Shinkansen

This is the first cable stayed bridge for the Shinkansen. The structure to diagonally suspend girders realized a light-weight bridge. (Granted the Tanaka Award by the Japan Society of Civil Engineers, and the JPCEA Award by the Japan Prestressed Concrete Engineering Association).

Sannai-Maruyama Over-road Bridge, Tohoku Shinkansen

The span length of this bridge is 150m, the longest of the Shinkansen. Deflection caused by the long span was successfully prevented from increasing in order to ensure that Shinkansen trains pass through the bridge safely and comfortably.
(Granted the Tanaka Award by the Japan Society of Civil Engineers, and the JPCEA Award by the Japan Prestressed Concrete Engineering Association).

Tunnel excavation technologies

NATM (New Austrian Tunneling Method)

This method, which allows tunneling of the ground by using the intrinsic strength of the ground, is capable of coping with various types of ground. It has been applied to tunnels in mountainous and urban areas where the overburdern is thin.

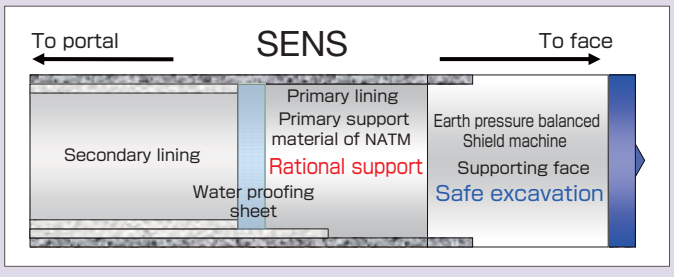
Shield tunneling method

The shield tunneling method uses a shield machine to excavate the ground, applies concrete panels to line the internal wall of the tunnel, and creates a large hole for trains to run in.

Shield machine
(Earth pressure balance method)

Double-track circular tunnel

SENS (Cast-in-place support system using shield)



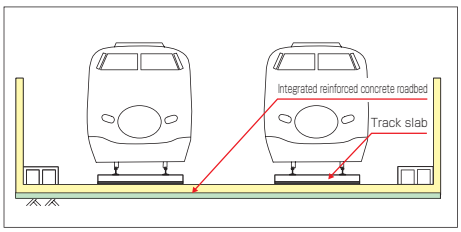
Internal form (Rear view of shield)

The SENS (Cast-in-place support system using a shield) is an innovative tunnel construction system (S) which comprehensively combines the advantages of face stability enabled by the shield tunneling method (S), prompt ground closure enabled by the ECL method (E), and primary support enabled by NATM (N).
(Granted the Technical Award by the Japan Society of Civil Engineers, and the Special Award by the Japan Industrial Technology Grand Prix Review Board).

Roadbed structure for slab tracks

Innovative roadbed structure (for slab tracks)

Slab tracks, the basic structure for Shinkansen tracks, were once unsuitable for structures made of soil, such as cut earth or embankments due to problems including subsidence.
But a new type of economically efficient roadbed structure has been developed that allows its use for slab tracks based on the results of R&D and testing.
(Granted the Technical Development Award by the Japan Society of Civil Engineers).



Railway construction technologies

Track structures for Shinkansen

Slab tracks, the basic structure for Shinkansen tracks, are adopted for viaducts, bridges, tunnels and earth roadbeds.

There are two types of track slabs: flat track slabs and frame track slabs. The latter are mainly used for tunnels and warm regions.

Flat track slabs (Tohoku Shinkansen)

Frame track slabs (Kyushu Shinkansen)

Track structures for conventional lines

Ballast tracks have been adopted for the track structures of conventional lines. However, in recent years, tracks directly fastened to anti-vibration sleepers are mainly used.

The tracks directly fastened to anti-vibration sleepers allow maintenance work to be carried out without difficulty, and are widely adopted for urban railways.

Viaduct section (Tsukuba Express)

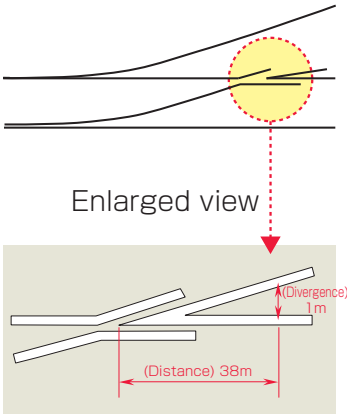
Tunnel section (Tsukuba Express)

Japan's Fastest Railway Turnout

For the Hokuriku Shinkansen (Takasaki - Nagano), we developed a new turnout designed to allow a Shinkansen train to run at 160 km/h on the turnout track, and installed those turnouts (No. 38 turnout: No. 38 means that the distance necessary to allow two tracks separate one meter apart is roughly 38 m) at the divergence points of the Joetsu Shinkansen..

The No. 38 turnout has also been adopted for the Narita New Rapid Line.

(Granted the Technical Development Award by the Japan Society of Civil Engineers).



Safe transportation during winter

"Snow-melting sprinklers", "Snow-melting warm water panel equipment", etc., are installed as countermeasures for snow damage in heavy snow fall areas, thus contributing to safe transportation during winter.

Snow-melting sprinklers
(Tohoku Shinkansen)

Snow-melting warm water panel equipment
(Hokuhoku Line)

User-friendly station facilities

Movable platform barriers, elevators, etc., are installed to allow every passenger to walk through the station safely and comfortably.

Movable platform barriers
(Tsukuba Express)

Movable platform barriers
(Kyushu Shinkansen)

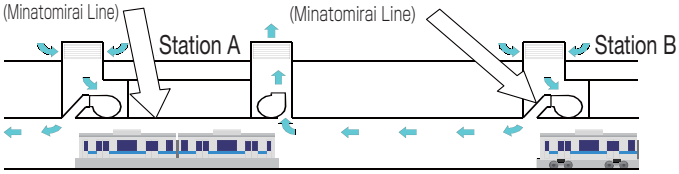
Elevator
(Minatomirai Line)

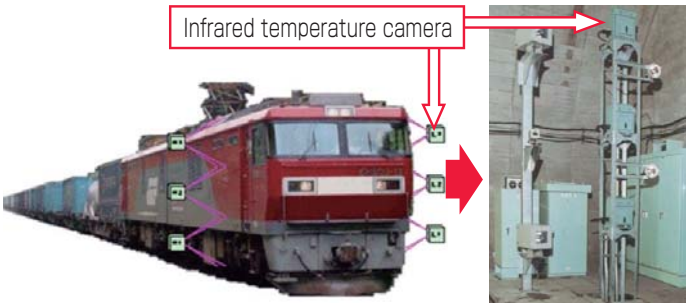
Air conditioners, ventilators, smoke ejectors, and fire-prevention equipment for subways and tunnels

Equipment important to ensure a safe environment and comfort in subways and tunnels includes: air conditioners, ventilators and smoke ejectors installed on the platforms, concourses and station offices; and ventilators and smoke ejectors installed in tunnels. Such equipment allows passengers to use stations safely and comfortably. Moreover, since the Seikan Tunnel is a long undersea tunnel, various fire-prevention measures are in place in case of fire emergency.

Air conditioner room for subway
(Minatomirai Line)

Ventilator room for tunnel
(Minatomirai Line)





Train fire detector (Seikan Tunnel)

Plant equipment supporting vehicle safety and comfort

We install equipment for efficient inspection and repair of rolling stock to ensure a safe and comfortable train ride.

Carbody elevating equipment
(Tsukuba Express Line)

Machines for railway construction

We have developed and introduced special machines, unique to railway construction, designed to facilitate track construction such as laying of rails, and electrical work such as catenary construction. Work is thus carried out safely and efficiently.

Traction vehicle capable of running on tracks as well as the ground, namely hi-rail car

Catenary work wagon (back left) and wire stretch car (front right)

Railway construction technologies

Attractive stations harmoniously integrated into the local environment

By asking local residents for opinions such as public comments to identify what kind of station they desire, we build attractive stations with their cooperation which are perfectly integrated into the surrounding environment, reflect local climates and cultures, or serve as landmarks.

Shichinohe-Towada Station,
Tohoku Shinkansen (Hachinohe - Shin-Aomori)

Shin-Tosu Station,
Kyushu Shinkansen (Hakata - Shin-Yatsushiro)

Safe, comfortable and user-friendly stations

We construct stations based on the so-called "universal design" which allows all users, including the elderly and physically impaired, to use the stations safely and comfortably.

Shin-Aomori Station, Tohoku Shinkansen
(Hachinohe - Shin-Aomori)
[A safe and user-friendly platform with a good view, equipped with platform barriers and benches]

Multifunctional toilet (Minatomirai Line, etc.)
[A multifunctional toilet which is very convenient for users]

Ninohe Station, Tohoku Shinkansen (Morioka - Hachinohe)
[Direction board placed properly in a large space with good visibility]

Bashamichi Station, Minatomirai Line
[A see-through elevator with good visibility and security]

Eco-friendly stations

When constructing railway facilities including stations and rolling stock depot, we proactively make contributions to improving the global environment by taking measures against global warming.

Iwate-Numakunai Station, Tohoku Shinkansen
(Morioka - Hachinohe)
[A large quantity of lumber is used for the interior of the waiting lounge]

Miraidaira Station, Tsukuba Express
[Japanese larch from Hokkaido is used for the beams of the large roof]

Using domestic lumber, etc.

Lumber manufacturing technology is experiencing significant innovations, and the utility value of lumber as a building material is increasing year by year. Especially, by proactively using forest thinnings and domestic lumber, forests will remain richly cultivated, and eventually CO2 emissions will be reduced.

Using natural energy

We study the cost-benefit with regard to proactive utilization of natural energy such as solar energy, solar heat, natural wind ventilation without depending on motors, rainwater, etc., and use it properly for stations, etc.

Greening the rooftops and sites

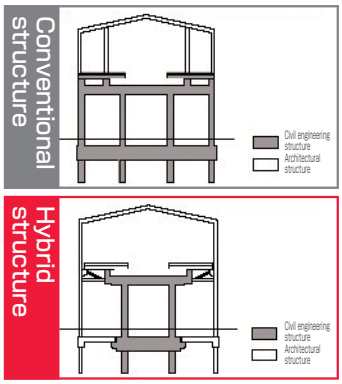
By greening the rooftops and sites, the heat island effect is reduced and global warming is prevented.

Stations focusing on economic efficiency and design

With the aim of shortening the construction period, cutting down on costs and improving design flexibility, we developed a “hybrid structure” (patented) combining a “civil engineering structure and an architectural structure”, and applied it to a variety of railways.

By adopting a 2-pillar viaduct instead of the conventional 4-pillar viaduct and integrating the pillars on both sides with the upper structure, the station facilities including concourses, escalators and elevators, etc., can be laid out more flexibly.

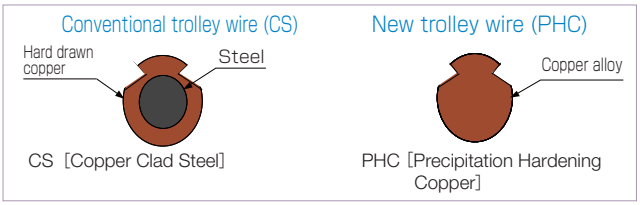
Midorino Station, Tsukuba Express
[The building frame is entirely covered by the exterior of the architectural structure]



Railway construction technologies

Overhead contact wires with high recyclability and high-speed resistance

As trolley wires for new Shinkansen lines, new PHC trolley wires with high recyclability and high-speed resistance were developed and first adopted in the Tohoku Shinkansen (Hachinohe - Shin-Aomori). The PHC trolley wires are made of copper alloy manufactured by adding Cr (chrome) and Zr (zirconium) to oxygen-free copper. As copper accounts for approx. 95.5% of the PHC trolley wire, it is completely recyclable.

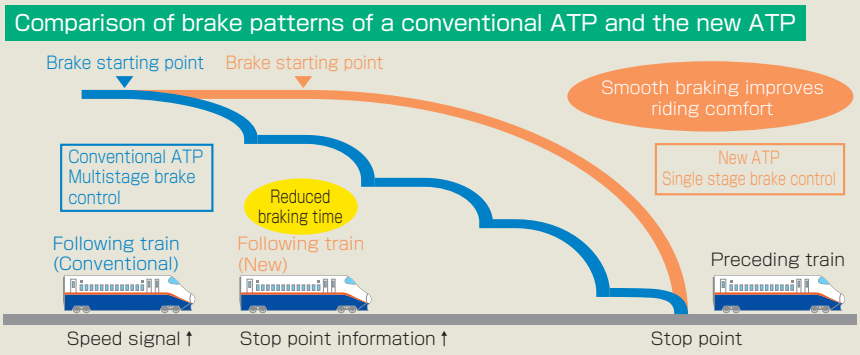


Tohoku Shinkansen (Hachinohe-Shichinohe-Towada), PHC simple catenary

New signal system

A new signal system with autonomous on-board device (ATP: Automatic Train Protection) has been put to practical use. This serves greatly to improve riding comfort, reduce braking time and shorten headway.

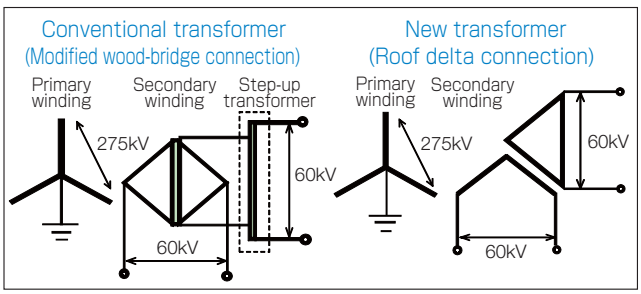
Also, the Tohoku Shinkansen (Hachinohe - Shin-Aomori) officially employed a non-insulation track circuit for the first time as a Shinkansen line.



Eco-friendly roof delta connected transformer

As an alternating current feeding transformer for ultrahigh voltage reception for the Shinkansen, a new roof delta connected transformer was developed and put into service to replace the conventional modified wood-bridge connected transformer.

This new transformer has a simpler structure than the conventional one and is more compact and light-weight, resulting in reduced power loss and enhanced eco-friendliness.




Roof delta connected transformer, Shin-Shichinohe substation, Tohoku Shinkansen

Major awards granted to JRTT

JRTT has been granted a number of domestic and overseas awards
for our achievements in railway construction projects and our railway construction technologies.

Awards for our achievements in railway construction projects

i . New Shinkansen lines

Construction of Tohoku Shinkansen (Hachinohe - Shin-Aomori)
Granted the Technical Award by the Japan Society of Civil Engineers in 2010

Construction of Kyushu Shinkansen (Shin-Yatsushiro - Kagoshima-Chuo)
Granted the Technical Award by the Japan Society of Civil Engineers in 2004

Construction of Hokuriku Shinkansen (Takasaki - Nagano)
Granted the Technical Award by the Japan Society of Civil Engineers in 1997

ii . Urban railways

Construction of Tsukuba Express Line
Granted the Technical Award by the Japan Society of Civil Engineers in 2005
Granted the Project Award by the Japan Railway Award Selection Committee
(The "Railway Day" Planning Committee)

Construction of Minatomirai Line
Granted the Design Award by the Japan Society of Civil Engineers in 2005
Granted the OTPA Award by the Eastern Asia Society for Transportation Studies

Awards for railway construction technologies

Technical developments

The innovative tunneling method known as "SENS", developed by combining NATM and the shield tunneling method → See page 31. **(Sanbongihara Tunnel, Tohoku Shinkansen)**
Granted the Technical Award by the Japan Society of Civil Engineers in 2004

Sannai-Maruyama Over-road Bridge → See page 30.
Granted the Tanaka Award by the Japan Society of Civil Engineers in 2008

Matsubara Inter Section Bridge, Kyushu Shinkansen → See page 9.
Granted the Tanaka Award by the Japan Society of Civil Engineers in 2009

Major awards granted to JRTT

Architectural facilities

Design of the "Shin-Minamata Station, Kyushu Shinkansen", and design direction for the neighborhood area

Granted a Special Award, the Public Architecture Award in 2008

Minatomirai Station Brunel Award - An international award -

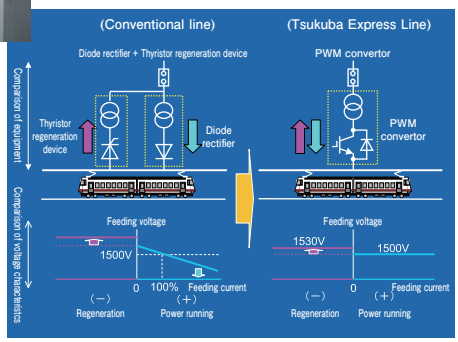
An award granted by Watford Group comprising globally renowned designers and architects in the railway field

Electrical facilities

Development and commercialization of the PWM converter

Granted the Railway Electrical Engineering Award by the Japan Railway Electrical Engineering Association

The PWM converter (PWM: Pulse Width Modulation) employed by Tsukuba Express is the world's first DC feeding system which supplies electrical power in a stable manner regardless of the frequency of trains by equalizing the voltage applied by the substation. Its regenerative electric power absorption function allows energy to be effectively used and saved.



Barrier-free

Outstanding Barrier-free Performance Award
(Barrier-free Promotion Liaison Council)

Akihabara Station

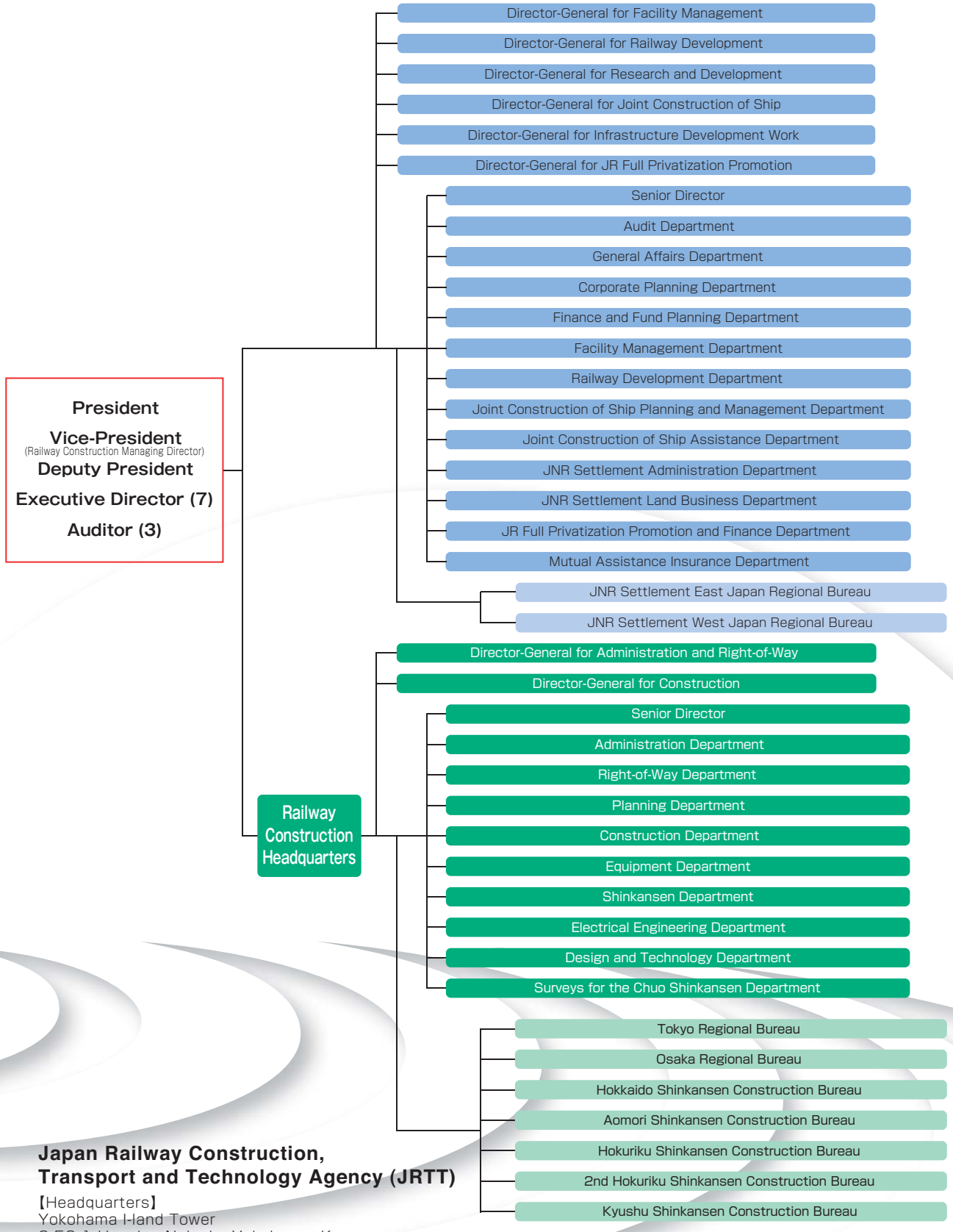
Others

Seikan Tunnel ■ Keiyo Line ■ Joetsu Shinkansen
Toyo Rapid Railway Line ■ Rinkai Fukutoshin Line
Hokuso Kaihatsu Railway Line ■ Sendai Airport Transit Line
Aichi Loop Line ■ Yamanashi Maglev Test Line, etc.

JRTT has been granted a number of awards also for many lines constructed when it was known as former Japan Railway Construction Public Corporation.

JRTT Organization Chart

(As of September 1, 2011)



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Japan Railway Construction, Transport and Technology Agency

JRTT

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