



- J-Flag -

(Quality Railway System of Japan)

Message

A railway system that epitomizes Japan's "no-nonsense work ethic" and "attention to detail"

Railways are different depending on the country or region, natural conditions, social and cultural environment, and their history of development. It is difficult to say which system is better.

We believe that the Japanese railway system is the best in the world, and Japan can provide optimal solutions to meet the diverse needs of the world.

Japan has been the winner in the bids for many projects. In reality, the countries that made the decision to adopt the Japanese railway system are the real winners.

J-Flag players

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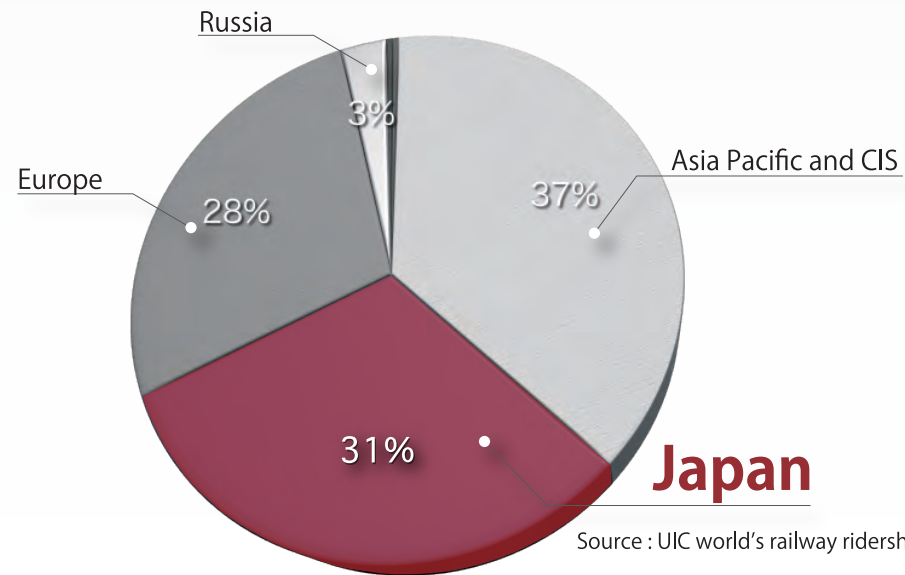
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1

Japanese railway : A transportation means chosen by the people

- ✓ Railway users in the world total 30 billion (2013) a year. Ridership in Japan is 9.1 billion, accounting for 31% of the world's ridership.
- ✓ Japan occupies the top spot even though it only has a population of 130 million. India is No. 2. It has a population of 1 billion and ridership of 8.2 billion. Germany is in the No. 3 spot. It has ridership of 2 billion. China is No. 4, with ridership of 1.6 billion.
- ✓ In other words, Japanese railway is loved by the people. It is the people's choice of transportation means.



2

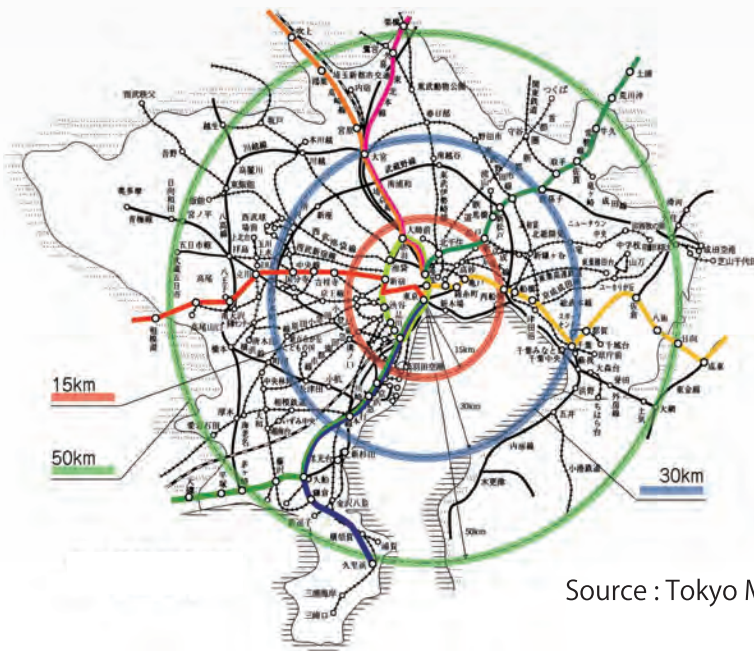
A safe, reliable, and high frequency mass transit system serving the Tokyo metropolitan area

10 big railway companies including JR East and Tokyo Metro

2,500 km railway network within 50 km radius

30,000 trains operated every day

38 million railway passengers every day



Source : Tokyo Metro

- ✓ In Tokyo (50-km radius), 30,000 trains are in operation every day, transporting 38 million passengers.
- ✓ Tokyo has a sophisticated railway network with a total length of 2,500 km. Ten major railway companies are in operation, including JR East and Tokyo Metro.
- ✓ The Metro lines and suburban railway lines have through operation with each other.
- ✓ The trains are operating in two-minute intervals during rush hours.
- ✓ Tokyo has 90% of railway ridership. In contrast, New York and London have about 20%.
- ✓ Tokyo enjoys high frequency, high volume railway services that are safe, reliable, accurate, punctual, and above all, comfortable.

These are the main characteristics of the Japanese railway system. It might appear similar to other railways in the world, but it is different and unique in many ways.

3

Japanese railway system : An accumulation of improvements that continue today

- ✓ The Japanese railway was launched in 1872, after Japan started adopting railway technology from the United Kingdom : the birthplace of railway. Since then, Japan has accumulated more than one hundred years of knowledge and experience.
- ✓ Seventy percent of Japan's national land is steep mountains. Japan is located in a region prone to earthquakes, typhoons, and other natural disasters. The coastal areas are narrow and have high population density.
- ✓ Japan has long years of experience in developing, constructing, and operating the best systems for addressing complex and diverse conditions.

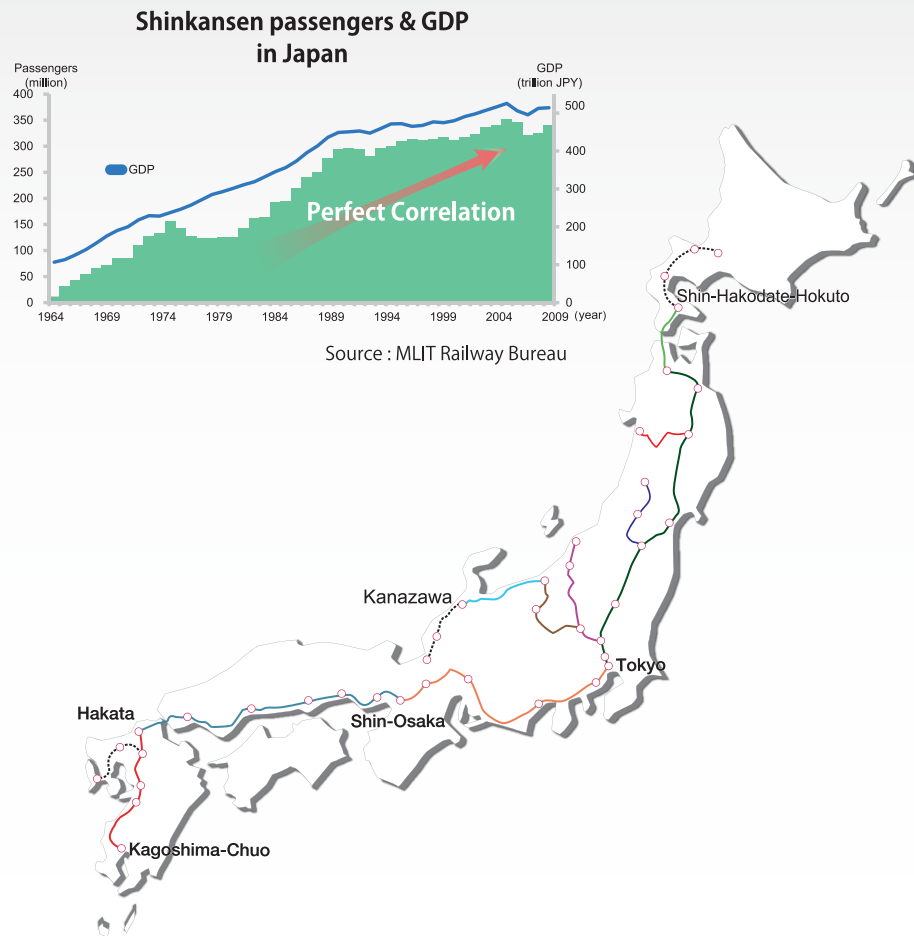
It is uniquely qualified to work with local personnel and entities worldwide to provide optimal railway solutions for all conditions.

History of Japanese Railway



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Railway : Key infrastructure supporting economic growth (Japanese economic miracle and Shinkansen network)

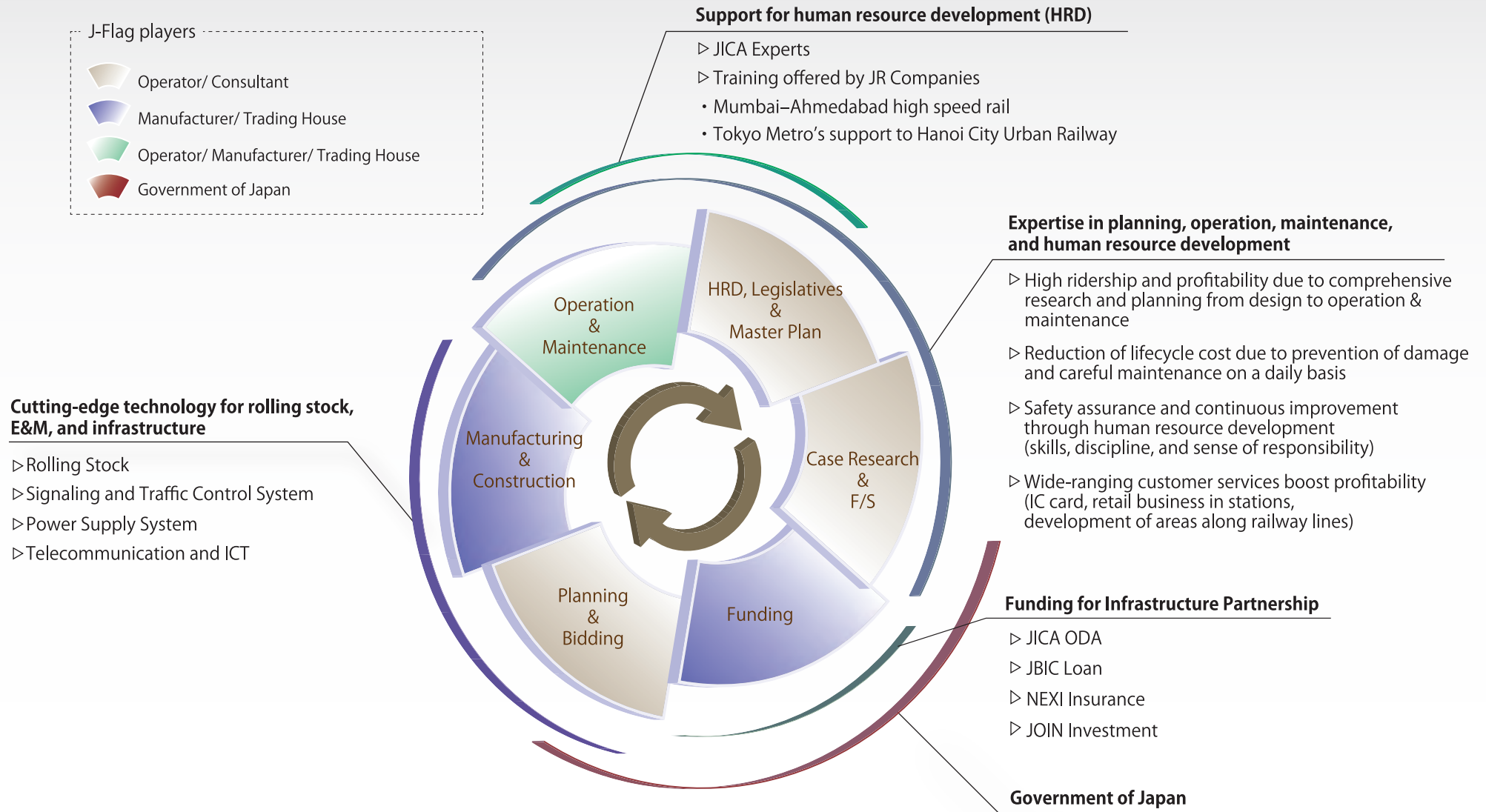


- ✓ Shinkansen is Japan's pride. It runs at 320km/h and has transported more than 10 billion passengers in over fifty years with zero fatal accidents.
- ✓ Shinkansen is the cornerstone of Japan's post-war economic growth. It expanded the accessible zone of a one-day trip dramatically, leading to effective use of national land and development of areas along the railway lines.
- ✓ Shinkansen has the world's highest levels of environmental and safety performance. At the time of the Great East Japan Earthquake in 2011, all 27 Shinkansen trains running at high speed were able to stop safely.
- ✓ Interestingly, increase in the number of passengers transported by Shinkansen and Japan's GDP growth shows a perfect correlation.
- ✓ Railway is indeed a key infrastructure in many countries and regions. Its quality affects the economy and the people's living standard. Japan takes great pride in its Shinkansen and urban railway networks.

They are unique in the world thanks to the steadfast efforts of its engineers and the astute judgment of policymakers.

5

Seamless teamwork is key to the high quality of Japanese railway



- ✓ *Japan's rail transport is made possible through close coordination and feedback between the process of HRD, cutting-edge technology, and expertise. It is based on seamless teamwork among J-Flag players.*
- ✓ *As J-Flag players, Japan's railway operators, consultants, manufacturers, trading companies are eager to work with their counterparts in partner countries.*
- ✓ *The Government of Japan also spearheads the "Partnership for Quality Infrastructure" initiative to provide funds and human resource training to support railway development overseas.*

6

Expertise in planning, operation, maintenance, and human resource development

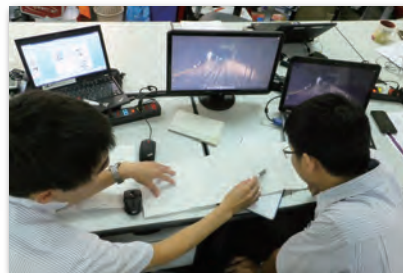
- ① High ridership and profitability due to comprehensive research and planning from design to operation & maintenance



- ② Reduction of lifecycle cost due to prevention of damage and careful maintenance on a daily basis



- ③ Safety assurance and continuous improvement through human resource development (skills, discipline, and sense of responsibility)



- ④ Wide-ranging customer services boost profitability (IC card, retail business in stations, development of areas along railway lines)



7

Cutting-edge technology for rolling stock, E&M, and infrastructure

① Rolling Stock

- Advanced technologies including lightweight car body and high efficiency motor, inverter, and other vehicle equipment reduce OPEX and facilitate maintenance.



② Signaling and Traffic Control System

- Smooth brake control of D-ATC shortens travel time and operation interval.
- Accurate traffic control ensures punctual, safe, and high frequency transport according to the timetable, and enables early recovery in the event of service disruption.



③ Power Supply System

- Energy-efficient electrical equipment, ground power storage and regenerative power equipment reduce OPEX.



④ Telecommunication and ICT

- Onboard display, passenger information system etc. improve customer service.
- Standardized fare collection using IC card enables through operation between different railway companies and enhances convenience for passengers.



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Funding for Infrastructure Partnership to facilitate introduction of Japanese railway system

JICA

- **Official Development Assistance (ODA) loan** : Provides loans to the governments of developing countries at concessional rates.
For example, interest rate of 1.4%, repayment period of 30 years, and grace period of 10 years for lower-middle income countries.
- **Private sector investment finance** : Investing in or providing funds to development projects carried out by private companies in developing countries.



JBIC

- **Amount committed for loans, equity participation and guarantees** : approximately 3.2 trillion yen (FY 2014)
- **Export loans** : Loans are provided to overseas importers and financial institutions to help finance exports of Japanese (including overseas affiliates) machinery, equipment, and technology mainly to developing countries.
- **Overseas investment loans** : Loans are extended to Japanese companies and overseas affiliates (including joint ventures) to support Japanese foreign direct investments, or to financial institutions and governments that make equity participation in or extend loans to these affiliates.



NEXI

- **Underwriting amount** : approximately 10.2 trillion yen (FY 2014)
- **Export credit insurance** : Insurance for loans to pay for exports and loans to finance overseas businesses
- **Overseas investment insurance** : Insurance for Japanese companies against loss from country risk in overseas investment



JOIN

- **Committed investment amount** : approximately 12 billion yen (FY 2015)
- **Investments** : Sharing risk through co-investing with the private sector while also facilitating smooth financial arrangements
- **Hands-on support** : Reducing operational risk by providing technical experts and officers to local entities



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Support for human resource development to facilitate introduction of Japanese railway system

JICA Experts

JICA dispatches experts to developing countries for supporting specific railway projects as well as developing capacity in railway administration including safety measures.



Training offered by JR Companies

Japanese rolling stock is being used in countries around the world. JR companies provide human resource training to personnel operating these vehicles, including inspection and maintenance.



Mumbai–Ahmedabad high speed rail

India and Japan have decided the Mumbai-Ahmedabad high speed rail corridor will be developed with the use of Japanese Shinkansen system. Japan will support human resource development including training of officials in charge of its operation (approximately 4,000 officials in total) and overseas study program in Japan (approximately 20 people per year).



Tokyo Metro's support to Hanoi City Urban Railway

The Japanese government has extended a yen loan to facilitate construction of railway lines in Hanoi City. In conjunction with the Japan International Consultants for Transportation, Tokyo Metro is assisting Hanoi to set up an organization for the operation and maintenance of these lines.



10

Seventy years of experience in exporting the ever-evolving Japanese railway technology overseas

Japan has been exporting rolling stock overseas more than 70 years from before World War II. Since the 1980s, the export of electric trains as well as the delivery of turn-key projects has increased drastically. In recent years, Japan has engaged in a wide array of activities overseas, including high speed rail in Taiwan, turn-key project in Dubai, upgrade of high speed vehicles in the United Kingdom, maintenance contracts by railway operators in Thailand.



• Taiwan High Speed Rail
(Shinkansen system in operation)



• United Kingdom IEP
(Intercity Express Programme)



• Thailand MRT Purple Line
(EPC contract, and a 10-year maintenance contract by a consortium that includes JR East)



• Dubai Metro
(fully automatic unmanned operation, EPC full turnkey project, completion with delivery ahead of schedule)



• Metro-North Railroad Commuter Train and New York City Subway
(production in US over 4,000 cars)

JORSA Members

Alna Sharyo Co., Ltd.

Fuji Electric Co., Ltd.

The Furukawa Battery Co., Ltd.

Furukawa Electric Industrial Cable Co., Ltd.

Hayashi Soji Corporation

Hitachi, Ltd.

Hitachi Nico Transmission Co., Ltd.

ITOCHU Corporation

Japan Transport Engineering Company

Kawasaki Heavy Industries, Ltd.

The Kiniki Sharyo Co., Ltd.

Kintetsu Railcar Engineering Co., Ltd.

Kyosan Electric Manufacturing Co., Ltd.

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Nippon Signal Co., Ltd.

Nippon Steel & Sumitomo Metal Corporation

Sojitz Corporation

Sumitomo Corporation

Taisei Techno Co., Ltd.

Taiwan Shinkansen Corporation

TOSHIBA CORPORATION

TOYO DENKI SEIZO K.K.

YASHIMA & Co., Ltd.

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