

Central Japan Railway Company GUIDE





Central Japan Railway Company

Central Japan Railway Company (JR Central, also known as JR Tokai) commenced operations in April 1987 upon the privatization and breakup of the Japanese National Railways (JNR).

The core of JR Central's operations is the Tokaido Shinkansen, the main transportation artery linking Japan's principal metropolitan areas of Tokyo, Nagoya, and Osaka, and a network of conventional lines centered on the Nagoya and Shizuoka areas.

JR Central and its consolidated subsidiaries also develop affiliated businesses that are expected to generate synergic effects with the railway business.

JR Central is steadily moving forward with efforts aimed at the early completion of the Chuo Shinkansen using the Superconducting Maglev system in order to carry out its mission continually.

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Notes:
 1. FY 2014 refers to the one-year fiscal year period ended March 31, 2015.
 2. In this guide, figures of financial information are truncated, while statistical data and all percentages are rounded.

1 Progress of Projects

Ensuring Safe and Reliable Transport Services



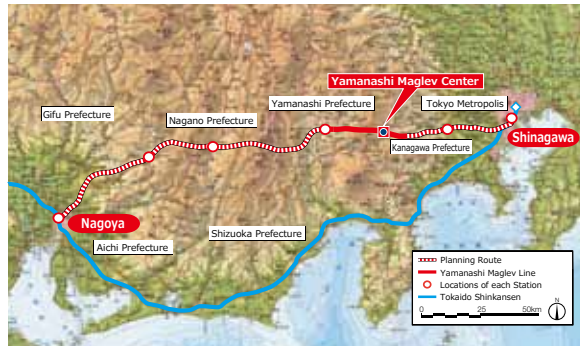
Renovation of the Hamamatsu Workshop (completion image)

Enhancing The Tokaido Shinkansen Transport Services



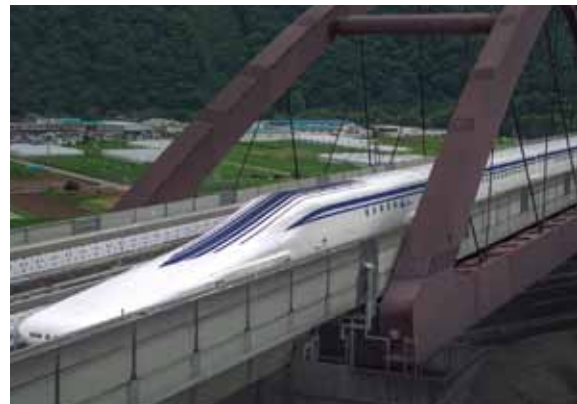
N700A

Promoting the Chuo Shinkansen Project that employs Superconducting Maglev technology



Route of the Chuo Shinkansen (Between Tokyo and the City of Nagoya)

Refining Superconducting Maglev technology and Reducing Costs



Series L0 (L zero)

Strengthening Technological Capability, Pursuing Overseas Projects & Preserving the Global Environment



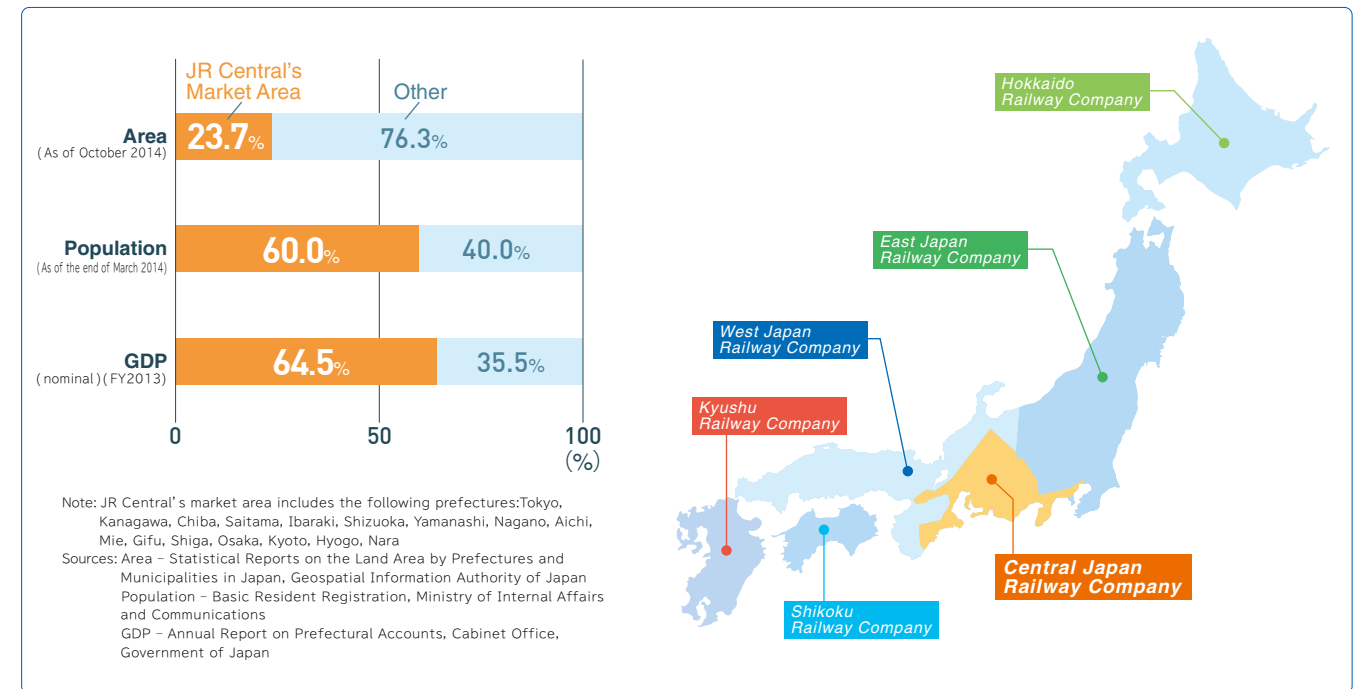
Truss Bridge (for tests)

JR Central Towers and JR Gate Tower Project



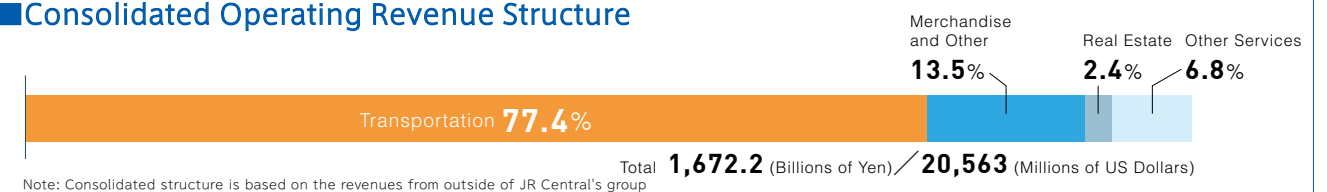
JR Central Towers and Gate Tower

2 JR Central's Market

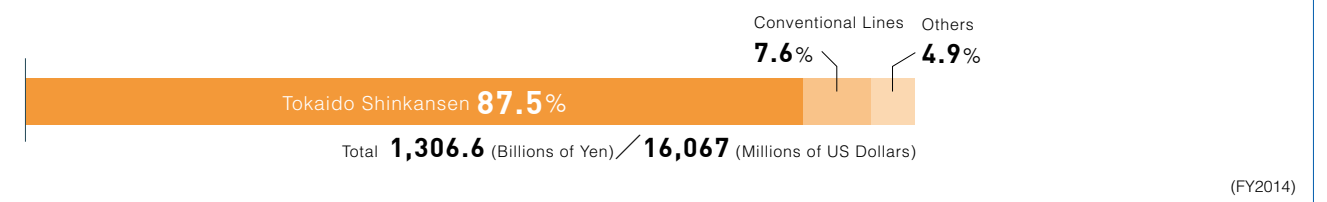


3 Operating Revenue Structure

Consolidated Operating Revenue Structure



Non-Consolidated Revenue Structure



4 Tokaido Shinkansen Characteristics and Performance

Safety



0
fatality / injury
since 1964

- No accidents resulting in fatalities or injuries to passengers onboard since operations commenced in 1964.
- Personnel are highly-skilled in safety awareness through comprehensive training
- Train control system with sophisticated technology; continuous safety-related investment (including countermeasures for derailment and deviation for further anti-earthquake measures) in addition to reinforcement of infrastructures

Punctuality



Annual Average Delay
0.6
minutes / operational train

- Annual average delay is 0.6 minutes per operational train (FY2014, including delays due to uncontrollable causes such as natural disasters)

High Speed



Maximum speed of
285
km/h

- Maximum speed of 285km/h (300km/h in the Sanyo Shinkansen section)
- The fastest "Nozomi" connects Tokyo and Shin-Osaka in 2 hours and 22 minutes, which is virtually the same time that this route takes by air if one includes the time necessary to travel between airports and city centers as well as check-in, etc.

High Frequency and Large Capacity



350
daily departures
1,323
seats per train

- An average of 350 daily departures (FY2014, including extra services), 1,323 seats per train
- A maximum of ten "Nozomi" trains run in each direction every hour. Daily passenger capacity of the Shinkansen between Tokyo and Osaka is approximately 340 thousand, which far exceeds that of airlines with approximately 30 thousand passengers. (FY2014)

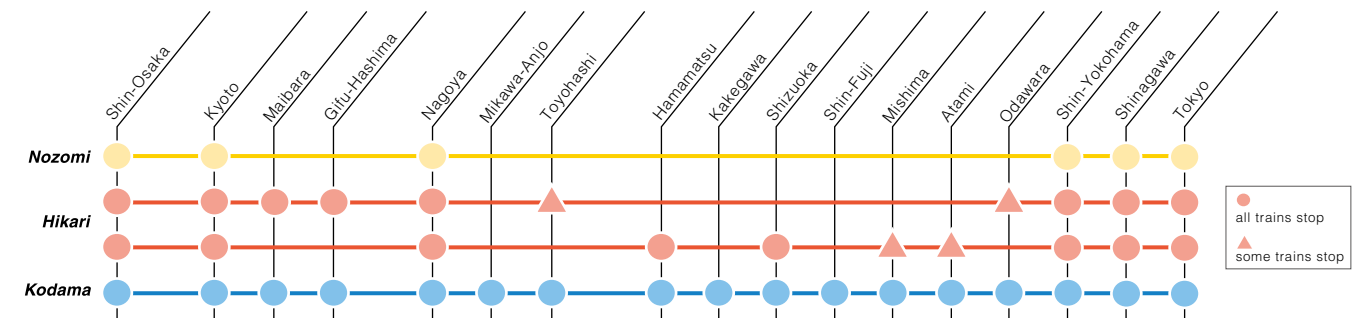
Comfort



- Rolling stock with enhanced riding comfort and noise suppression
- Comfortable interior space that meets various needs of passengers such as a wireless LAN Internet connection service in Series N700/N700A available between Tokyo and Shin-Osaka
- Constant renovation of stations and installation of new facilities such as elevators, escalators, smoking rooms.

5 Major Stopping Patterns / Train Diagrams

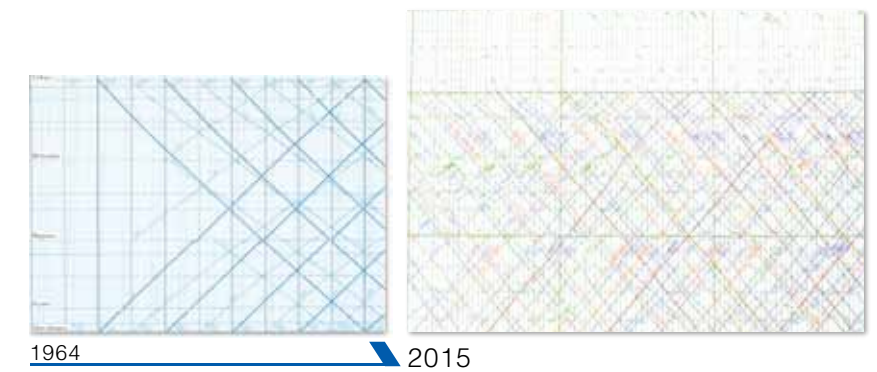
The Tokaido Shinkansen consists of Nozomi, Hikari, and Kodama, all of which have different stopping patterns.



Service between Tokyo and Shin-Osaka offered only 2 trains/hour when it first started running in 1964. Now the number of Nozomi trains/hour has increased to 10 at peak hours from Tokyo.

	1964 (Inauguration of Shinkansen service)	2015 (March)
Travel time	4 hr.	2 hr. 22 min. ^{*1}
Trains/day	60	350 ^{*2}
Ridership/day	61,000	431,000

Note: *1. Based on the fastest "Nozomi" service
*2. Including extra services

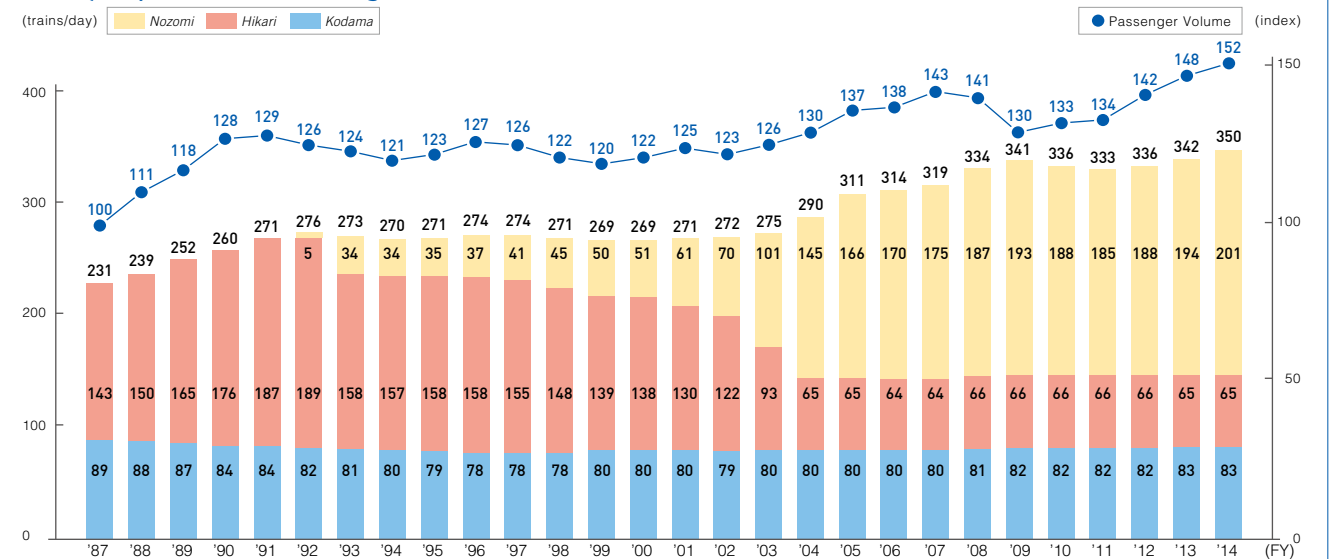


6 The Number of Train Departures and Ridership

To meet the needs of Tokaido Shinkansen passengers, JR Central operates 350 regular trains per day (including extra services) and up to ten "Nozomi" services per hour on the Tokyo~Shin-Osaka

route, which provides passengers with a high volume and high frequency transport service.

Daily Departures and Passenger Volume for the Tokaido Shinkansen



Note: 1. Including extra trains
2. Passenger volumes are the indices of the total passenger volume at certain points. FY1987=100
3. The figures of "Nozomi", "Hikari", and "Kodama" do not always equal the totals due to rounding.

7 Comparison of Intercity Transport Services

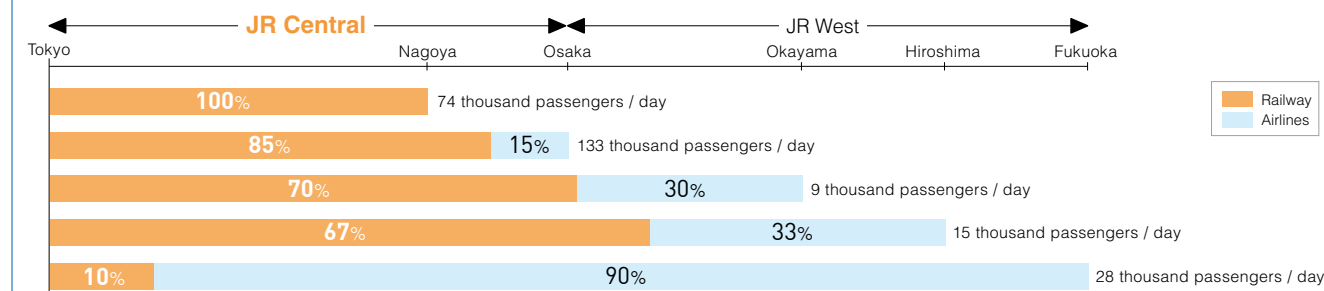
Services

(As of April 2015)

Between Tokyo and ... (Operating distance)	Osaka (552.6 km)	Okayama (732.9 km)	Hiroshima (894.2 km)	Fukuoka (1,174.9 km)
Travel Time*1	Shinkansen 2 hr. 22 min. ³	3 hr. 09 min.	3 hr. 44 min.	4 hr. 47 min. ⁴
	Airlines*2 1 hr. 5 min. (Approx. 2 hr. 40 min.)	1 hr. 10 min. (Approx. 3 hr.)	1 hr. 20 min. (Approx. 3 hr. 10 min.)	1 hr. 35 min. (Approx. 2 hr. 50 min.)
Departures / day	Shinkansen*5 250	128	99	67
	Airlines 106	24	34	112

*1.Travel times are in case of the fastest service
 *2.Travel times in parentheses include transfer and access times between city centers and airports
 *3.Travel time between Tokyo and Shin-Osaka stations
 *4.Travel time between Tokyo and Hakata stations
 *5.Excluding extra service

Market Share (against Airlines)



Note1: Market share is calculated by JR Central based on the inter-prefectural data of the inter-Regional Passenger Mobility Survey, published by the Ministry of Land, Infrastructure, Transport and Tourism (FY2014).
 Note2: Tokyo Area: Tokyo, Kanagawa, Chiba, Saitama, Ibaraki / Nagoya Area: Aichi, Gifu, Mie / Osaka Area: Osaka, Kyoto, Hyogo, Nara

FY2014

8 The Shinkansen General Control Center

The Shinkansen General Control Center in Tokyo is equipped with the latest systems to safely and accurately control the operation of the Tokaido and Sanyo Shinkansen. Six(6) control groups of JR Central and JR West share the system.



Controllers

① Train Operation

Checks operation status, such as train route and location, in real time. Gives suitable instructions to station staff and train crew.

② Passenger Service

Quickly provides various types of information on passenger transport to station staff and conductors. Also manages the seat ticketing system.

③ Crew & Car Utilization

Gives instructions to train crew about work route changes and transfer arrangement changes in addition to arranging rolling stock usage schedule.

④ Track & Structure Maintenance

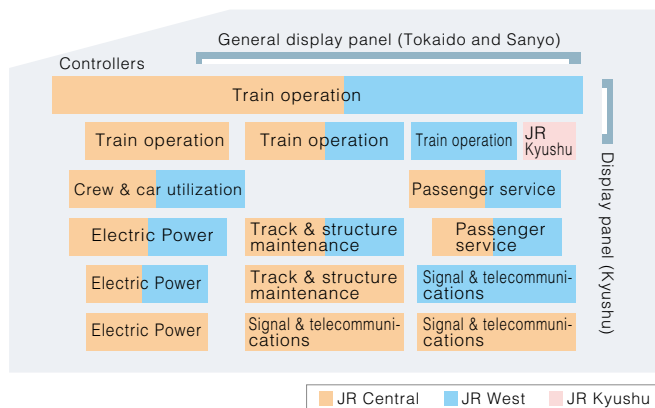
Ascertains track condition and manages track maintenance.

⑤ Electric Power

Monitors electricity supply in order to operate trains smoothly.

⑥ Signal & Telecommunications

Monitors the operating status of signal and communications equipment such as COMTRAC, CTC, ATC and train radio systems.

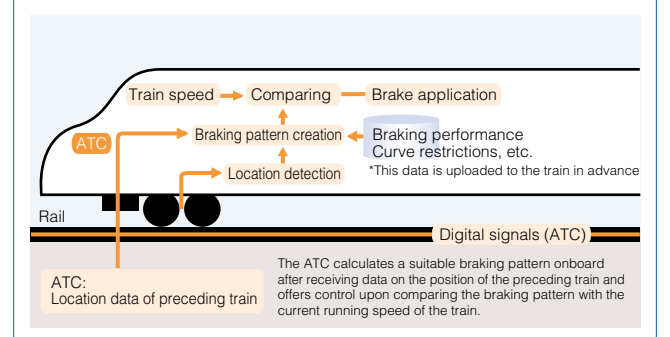


9 ATC (Automatic Train Control)

The ATC system is a safety mechanism used along the entire range of the Tokaido Shinkansen. Based on the location and speed of the preceding train, as well as track conditions, the ATC will continuously display a maximum speed limit to the driver. If the driver exceeds this speed, the ATC automatically applies the brakes to slow the train to its permitted speed. Unlike the former multi-step braking system, the ATC employs a single, uninterrupted brake that provides a smoother transition between speeds.

The ATC control hardware is located on the ground and not aboard each train, so by digitizing the signal used to send and receive data the ATC system can process these data more quickly, and in larger volumes. This improves the system reliability and safety, but also results in a more comfortable ride for the passenger and more flexibility in train scheduling.

Mechanism of ATC



10 General Education Center

Our personnel are the ones who maintain daily safe and reliable operations, and thus JR Central considers personnel training as a crucial aspect to our safety. Our education and training is based on on-the-job training in the field, group training for basic and specialized knowledge and skills, and a correspondence training system for the support of employees' self-development. Our group training aims to systematically improve the knowledge and skill, as well as the discipline required for personnel who are in charge of the railway industry. The General Training Center plays a main role in these group training programs.

At the General Education Center, personnel with a high degree of motivation, knowledge, and skill are cultivated through practical training using equipment such as training tracks and electric/signal communications equipment. Commercial operation-related apparatus is also used, such as ticketing machines and automatic ticket gates, in addition to a training simulator which uses the full-scale body of the Series N700.



General Training Simulator (Shinkansen)

Enables joint training among drivers, conductors, control center staff, and station staff under realistic conditions. Training for multiple jobs, skills improvement and handling an emergency are all conducted here.



Simulators for Station Staff and Conductors

Enables joint training among train crews and station staff under emergency conditions. Used to improve the skill of onboard announcements, door operations for conductors and to simulate emergency situations for station staff under realistic conditions.



Training Tracks

Equipped with the same facilities as revenue service lines, such as rails and overhead catenaries, enable maintenance workers to partake in realistic training.



General Education Center

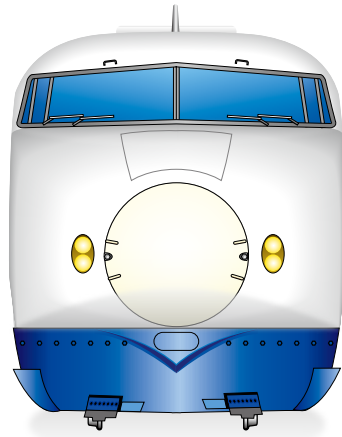
11 Rolling Stock

There Are No Limits to Improving Quality. Shinkansen Rolling Stock Continues to Evolve.

At its commencement in 1964, the Series 0 applied the innovative technology of the time.

The Series 300 followed and achieved a speed of 270km/h, the Series 700 enhanced passenger comfort and environmental friendliness, and then the Series N700 was born and brushed up high speed, comfort, and energy efficiency to the world's highest standards.

The N700A made its debut in February 2013, with additional advancement to safety, reliability, riding comfort and environmental performance. In March 2015, the N700A and the Series N700 increased its maximum speed from 270km/h to 285km/h. To preserve the premier standards set in high-speed rail, Shinkansen rolling stock will continue its pursuit for further evolution.



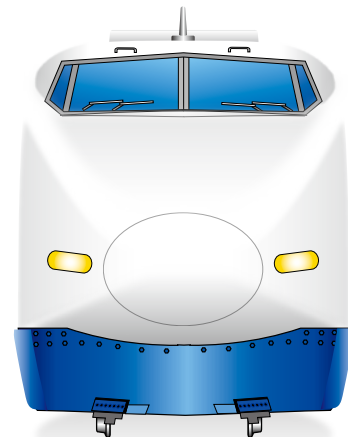
Series 0

MAX speed 220km/h

(October 1964~September 1999)

The Series 0, the first rolling stock used at the commencement of the Tokaido Shinkansen in 1964, opened the door to the high-speed rail era as a pioneer.

As the world's first rolling stock to commercially operate at a speed over 200km/h, the Series 0 was revolutionary.

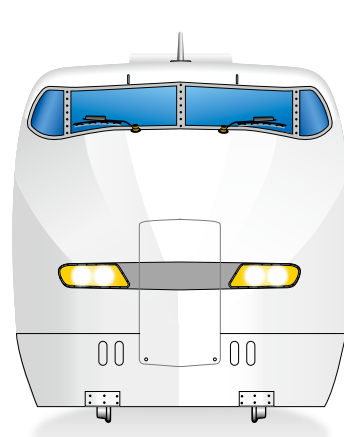


Series 100

MAX speed 220km/h

(October 1985~September 2003)

Based on the Series 0, the Series 100 was developed to improve passenger service and offered a double-deck Green Car (First Class Car), private rooms and new cabin amenities.



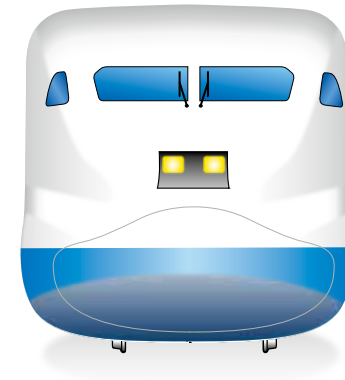
Series 300

MAX speed 270km/h

(March 1992~March 2012)

The Series 300 marked the second generation of Shinkansen rolling stock.

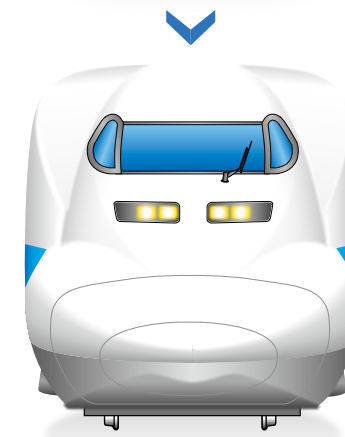
It achieved a maximum speed of 270km/h, and employed VVVF (Variable Voltage Variable Frequency) control units and an AC induction motor. With a light car body made of aluminum alloy and bolsterless bogies, the Series 300 was much lighter than previous rolling stock and epitomized drastic leaps in engineering innovation.



300X

The 300X test train was used for running tests from 1995 until 2002 to create the latest and best high-speed rail system. In 1996, the 300X set a domestic maximum speed record of 443km/h.

The technical knowledge gained from these running tests has been widely integrated within the development of new rolling stock, such as on the Series 700.



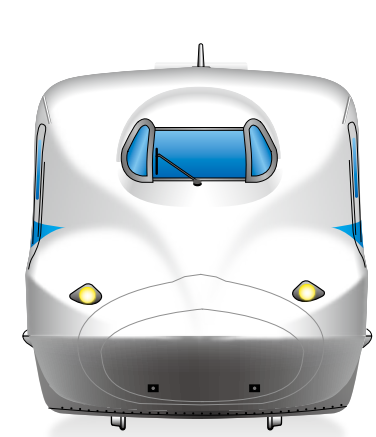
Series 700

MAX speed 270km/h (Sanyo 285km/h)

(March 1999~present)

The Series 700 was developed jointly by JR Central and JR West. In addition to a commercial operation speed that exceeds 270km/h, the Series 700 offers a high level of passenger comfort and environmental compatibility.

The Series 700 was a further evolution of second-generation Shinkansen rolling stock that started with the Series 300.



Series N700 and N700A

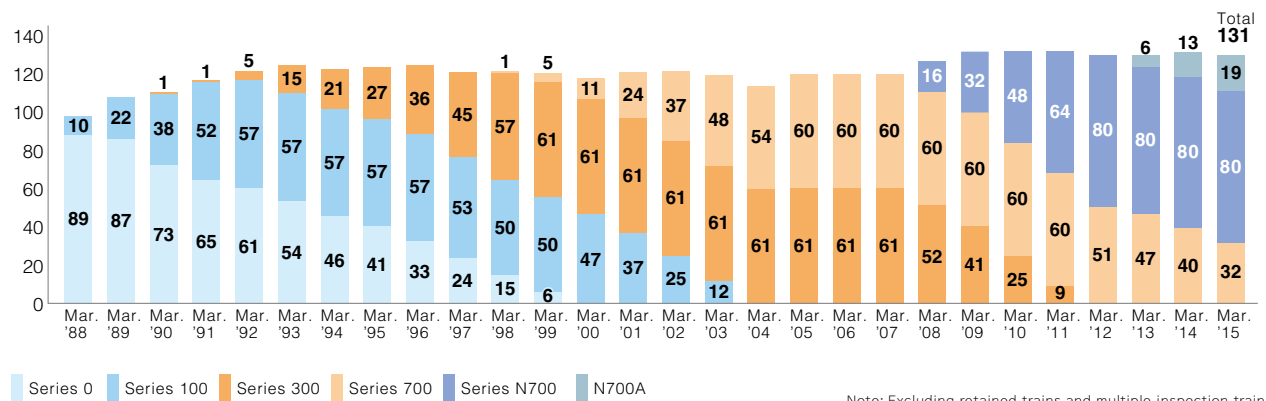
MAX speed 285km/h (Sanyo 300km/h)

(July 2007~present)

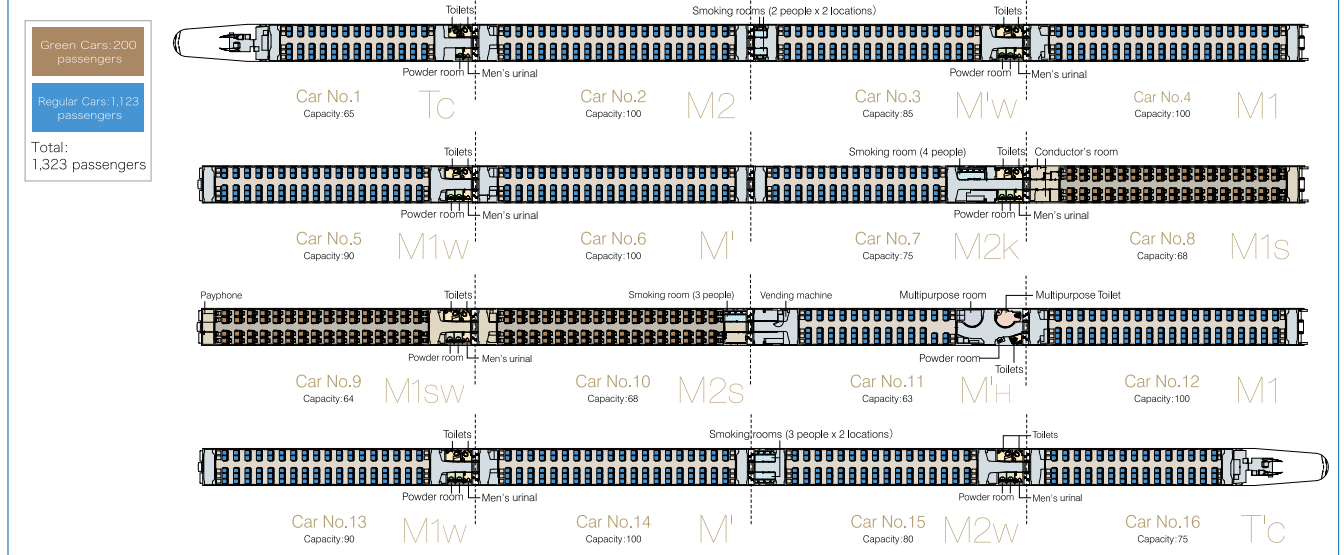
Based on the great potential of the Series 700, the Series N700 offers even better comfort and environmental compatibility. The Series N700 consumes 16% less energy than the Series 700 and produces 1/12 the CO₂ emissions of an airplane.

In March 2015, the N700A and the Series N700 increased its maximum speed from 270km/h to 285km/h.

Number of Tokaido Shinkansen Trainsets



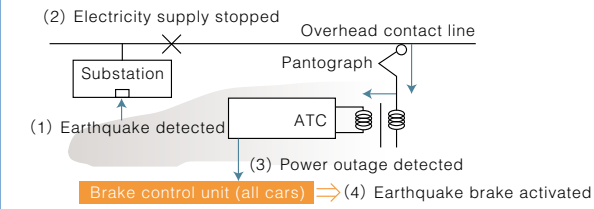
Configuration (N700A)



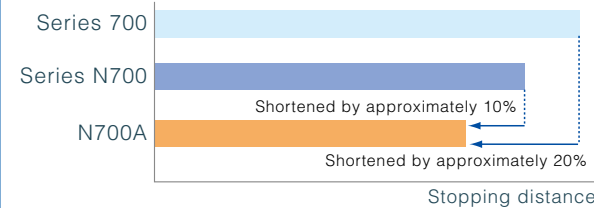
12 N700A's Advanced Technology

Safety Improvements

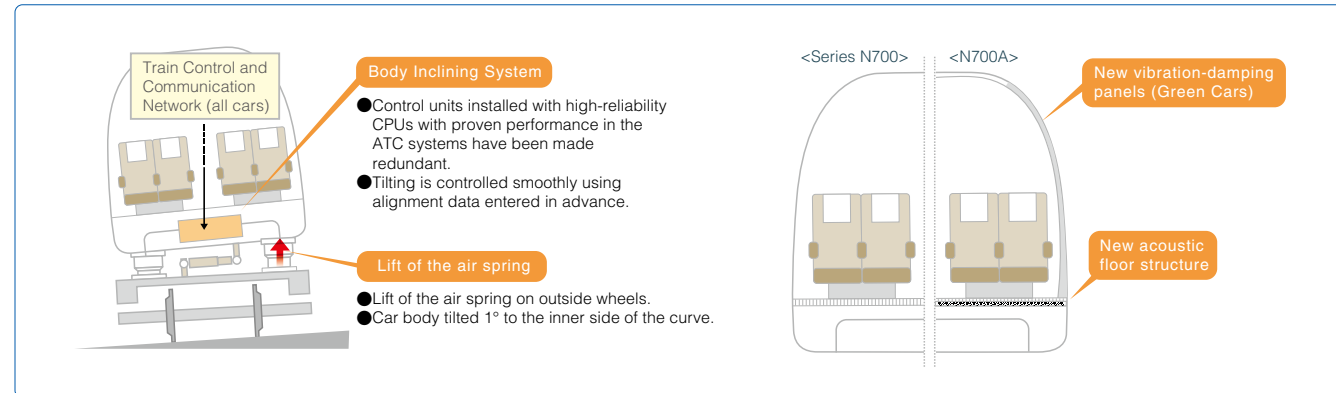
"Earthquake Brake" Overview



Stopping Distance Comparison

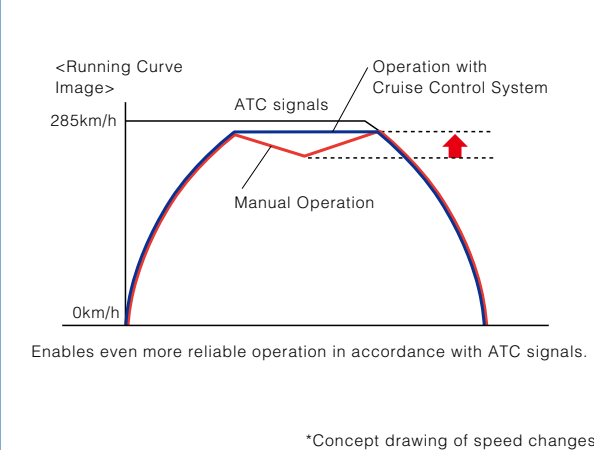


Comfort Improvements

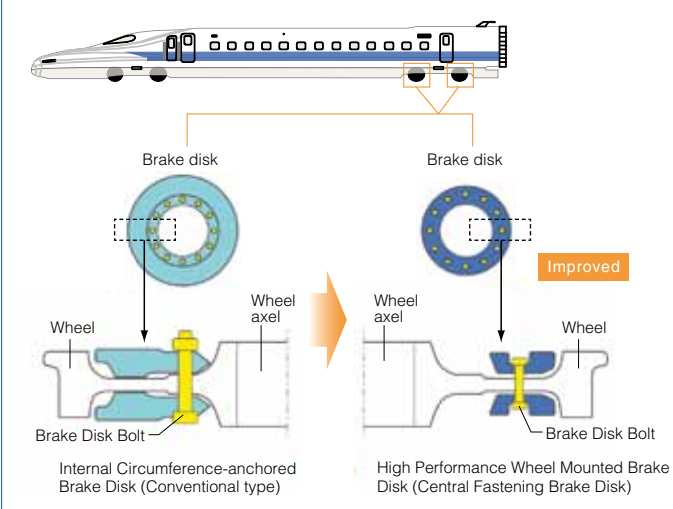


Reliability Improvements

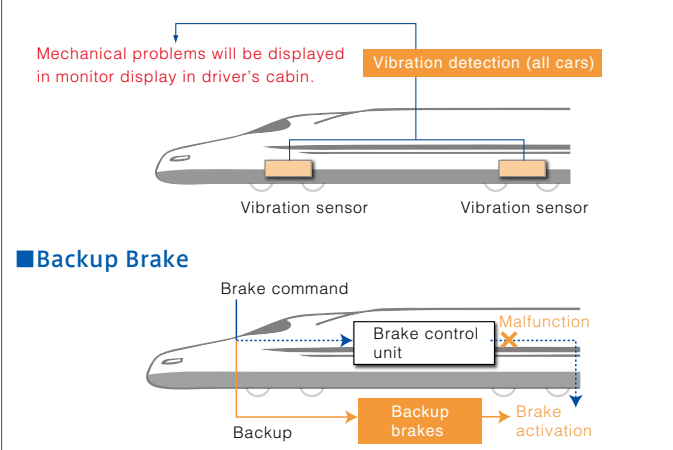
Cruise Control System



High Performance Wheel Mounted Brake Disk



Employment of Bogie Vibration Detection System



13 Dr. Yellow

"Dr. Yellow" Accurately Inspects the Condition of Tracks and Electrical Facilities

The Class 923 Shinkansen Multipurpose Inspection Train (referred to as "Dr. Yellow") is equipped with cutting-edge equipment and used to check the condition of the tracks and electrical facilities whilst running on revenue serviced routes approximately every 10 days.

The safe and reliable transportation of the Shinkansen is guaranteed by this accurate data.



Dr. Yellow (T4 trainset) can Inspect Track Conditions at a Speed of 270km/h

In September 2001, the T4 "Dr. Yellow" was introduced to replace the conventional T2 trainset.

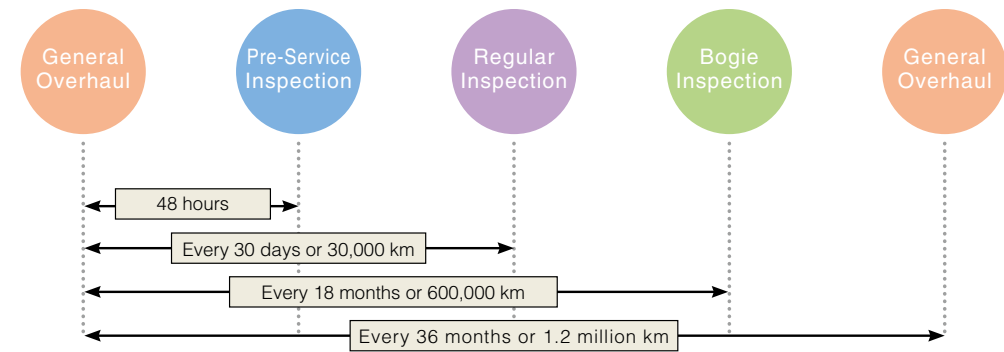
There were four areas that were focused on during the development and design of the inspection train. (1) Reach a maximum speed of 270km/h to avoid disturbing the revenue service timetable. (2) Ensure compatibility with the latest inspection technology and future adaptation. (3) Consider reducing the cost of new manufacturing and rolling stock maintainability, and (4) Consider long inspection times.



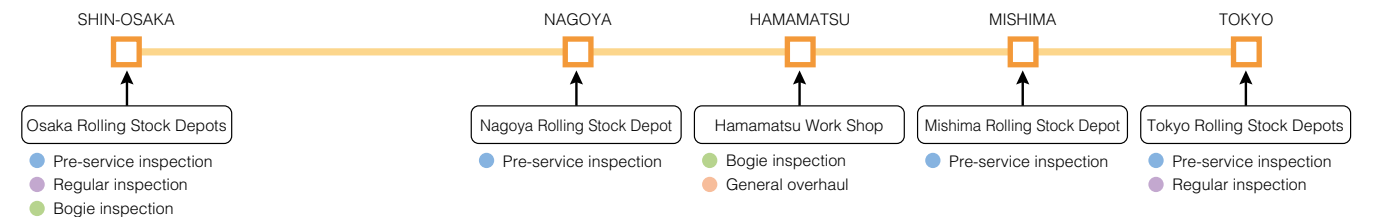
14 Maintenance Management of Shinkansen Rolling Stock

As a preventative maintenance measure, a periodic inspection and repair system is incorporated into the train management schedule to maintain the safety of Shinkansen rolling stock.

Types and Intervals of Inspection



Rolling Stock Depots and Workshop



15 Earthquake Countermeasures

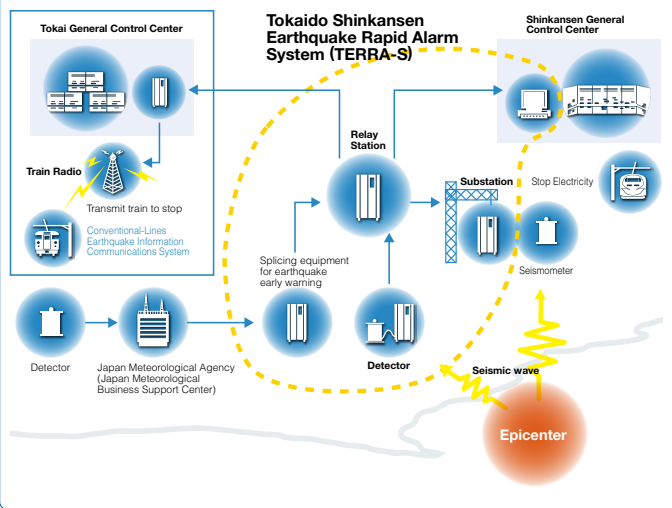
Tokaido Shinkansen Earthquake Rapid Alarm System (TERRA-S)

The Shinkansen employs TERRA-S that quickly brings trains to a halt when there is an earthquake. TERRA-S detects the P waves of an earthquake at detection points distant from the tracks and

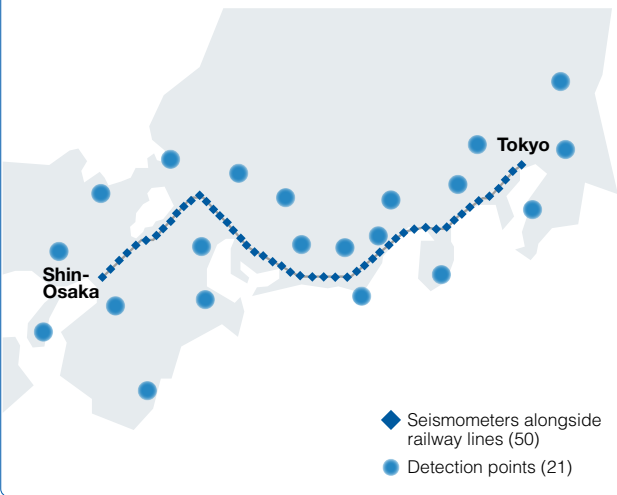
sends a signal. If necessary, that will quickly reduce the speed of trains before the S wave arrives at the train tracks.

P wave: Primary wave S wave: Secondary wave

Train Control System in the Case of Earthquakes



Locations of Seismometers and Detection Points

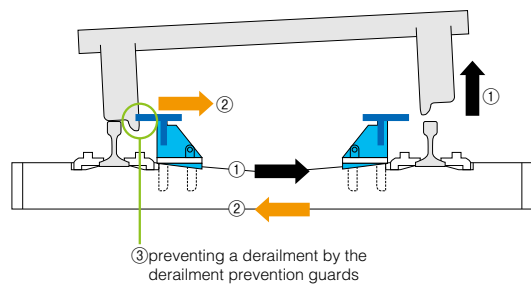


Countermeasures to Prevent Derailment/Deviation



Derailment Prevention Guards

Example) The effect of derailment prevention guards on a rocking derailment, which is one type of derailment caused by earthquakes.
 ①When the tracks move laterally during an earthquake, the wheels on one side collide with the rails while the wheels on the other side bounce up from the shock.
 ②The train derails when the tracks then move in the opposite direction at this instant. (Rocking derailment)
 ③Since the wheels opposite from the wheels that have bounced up are still riding on the rail, the derailment prevention guards prevent a derailment by stopping these wheels from moving any further in the lateral direction.



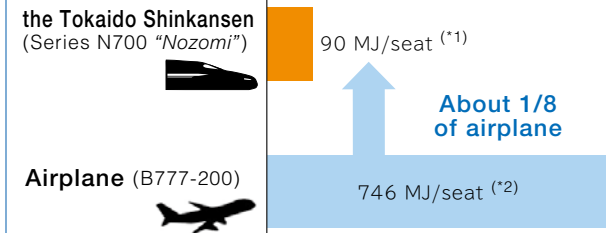
Deviation Prevention Stoppers

In order to prevent as much as possible large rolling stock deviations from track in case of a derailment, "Deviation Prevention Stoppers" have been installed at the bottom of all Shinkansen rolling stock bogies.

16 Environmental Sustainability

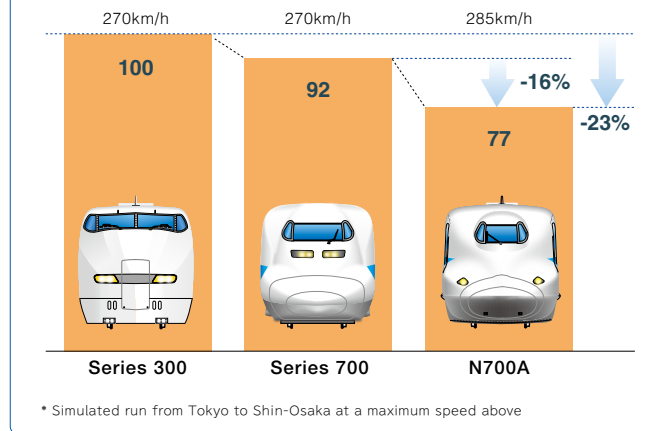
Comparison of the Tokaido Shinkansen and Airplane (Tokyo~Osaka)

Comparison of Energy Consumption per Passenger Seat



*1.Calculation based on running performance (JR Central figures) Series N700 "Nozomi" (Tokyo~Shin-Osaka)
 *2.Calculated by JR Central while referencing ANA's Annual Report 2011 B777-200 (Haneda~Itami/Kansai Airport)

Comparison of electric power consumption by the Tokaido Shinkansen rolling stock type



17 "Express Reservation" Service

JR Central offers "Express Reservation" along with "PLUS EX" services, which can be used with various credit cards and for frequent customers of the Tokaido Shinkansen who use it mainly for business. These services can shorten the total travel time of customers because they can change their reservation repeatedly online without any fee and can also get on trains by touching their IC card on the Tokaido Shinkansen "EX-IC card" reader at the ticket gate.

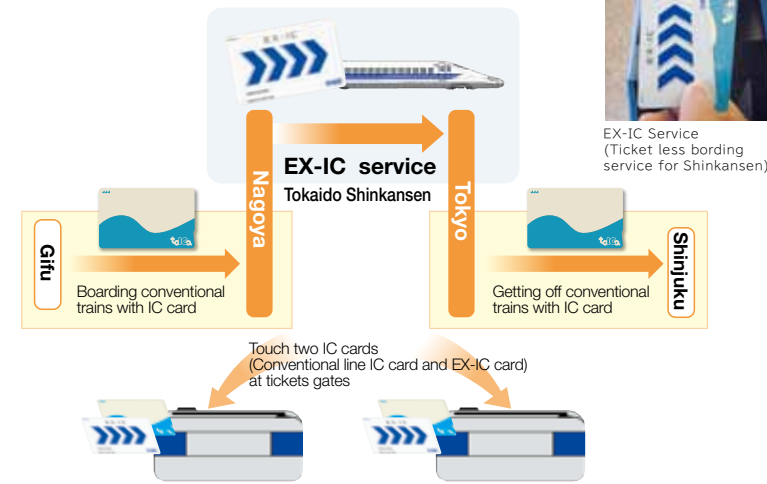
Furthermore, when transferring to a conventional line, customers

can transit smoothly by touching two cards, "EX-IC card" and another IC card for conventional lines such as "TOICA" together on the reader at the ticket gate.

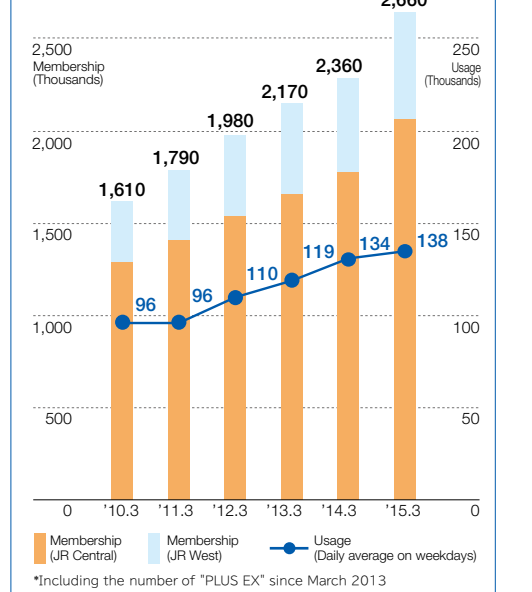
The number of users of the "Express Reservation" system together with "PLUS EX" service is 2.66 million, and daily usage on weekday is steadily increasing, becoming about 140 thousand (as of March 2015). "EX-IC Service" accounts for approximately 80% of the total usage, gaining the members' favor.

Concept Image of Using the "EX-IC card" along with "TOICA"

Transferring between the Shinkansen and the conventional lines is seamless with the use of "TOICA" (a conventional line IC card) and an "EX-IC Card."



"Express Reservation" service



18 High-Speed Rail around the World

The Tokaido Shinkansen was the world's first high-speed rail system when it started in 1964 and takes pride in holding some of the highest standards among other high-speed rail systems that subsequently developed in other countries.



Tokaido Shinkansen



TGV (France)



ICE (Germany)

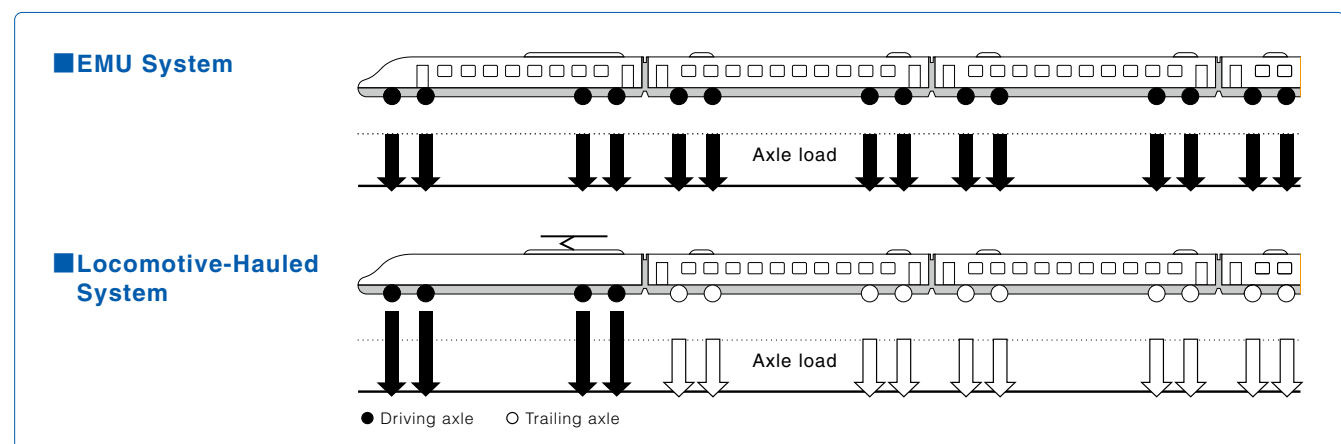
Inauguration	1964	1981	1991*
Route	Tokyo~Shin-Osaka	Paris~Lyon	Cologne~Frankfurt
Distance	552.6 km	418 km	197 km
Trains / Day	350	166	117
Maximum operating speed	285 km/h, 300 km/h (Sanyo)	300 km/h	300 km/h
Characteristics of rolling stock	[Series N700 and N700A]	[TGV Duplex]	[ICE 3]
Traction	EMU	EL	EMU
Power supply	25 kV AC 60 Hz	25 kV AC 50 Hz & 1.5 kV DC	15 kV AC 16 2/3 Hz
Seat pitch (2nd class)	1,040 mm	920 mm	971 mm
Passenger capacity	1,323	510	429

Note: * The ICE3 service on the Cologne - Frankfurt high-speed line started in 2002. (The figures for TGV and ICE are based on Thomas Cook (Summer 2015))

19 Advantages of the EMU (Electric Multiple Unit) System

Distributed motor power is inherently more effective than centralized motor power.

Characteristics	Advantages
Low axle load	Reduction of construction cost and track maintenance cost Low noise and ground-borne vibration
Stable adhesion performance	High acceleration and deceleration Reliable service in bad weather conditions
Effective regenerative braking	Energy saving Reduction of brake maintenance
Effective use of floor	Large capacity
Redundancy of traction system	High reliability



20 Overseas Deployment of High-Speed Rail Systems

Today, global warming is a pressing issue. There are many environmentally-friendly construction projects for high-speed rail that are underway all over the world. JR Central is promoting the overseas deployment of high-speed rail systems by leveraging the comprehensive high-speed rail technology which performs at the world's highest level. JR Central believes that the overseas deployment of its

high-speed rail system will be a meaningful project that enables domestic manufacturers to maintain and strengthen their technology and skills through the expansion of the international high-speed rail market, and also may lead to technological innovation and cost reduction of railway-related equipment.

C&C (Consulting and Coordination) Business

"C&C (Consulting and Coordination) Office-Overseas High Speed Railway Project" section mainly promotes overseas deployment of high-speed rail systems. The C&C office proposes the deployment of high-speed rail as a total system that includes civil engineering structures, track, electrical equipment, signaling equipment, rolling stock, operation management systems, maintenance and repair, etc. to overseas high-speed rail markets.

As overseas high-speed rail projects continue to flourish, this section will coordinate with relevant Japanese companies to provide support and consultation where necessary, for the safe and reliable operation of a high-speed rail system. Examples of this include providing operation and maintenance manuals as well as training personnel.

① The N700-I Bullet and SCMAGLEV

JR Central is proposing two high-speed rail systems called the "N700-I Bullet" and "SCMAGLEV" to overseas markets. The "N700-I Bullet" is a total high speed rail system that consists of mainly the "N700-I" rolling stock. The "N700-I" is based on Series N700 operated in Japan and refers to an eight-car train (Series N700 is a 16 car train) that meets the overseas market trends and can travel at a maximum speed of 330km/h (205mph). The Superconducting Maglev (SCMAGLEV) is a high-speed transportation system developed by JR Central that can operate at a speed of 500km/h (311mph).

JR Central engages diligently in marketing activities for "N700-I Bullet" in the State of Texas and for "SCMAGLEV" in the north east corridor of the United State between Washington D.C. and New York City.

② Technical Consulting Agreement with Taiwan High Speed Rail

JR Central signed a technical consulting agreement with Taiwan High Speed Rail Company which operates high speed rail in Taiwan in April 2014 and provides consulting service as the first C&C business entrusted by overseas railway operators.



Overseas High-Speed Rail (completion image)



Prime Minister Abe and U.S. Ambassador to Japan Kennedy, visiting the Yamanashi Maglev Line (April 12, 2014)

Additional Efforts for Overseas Deployment of the N700-I Bullet and SCMAGLEV

JR Central, JR West, JR East and JR Kyushu established the International High-Speed Rail Association (IHRA) in April 2014 to promote Japanese high speed rail system based on the principle of "Crash Avoidance" as a global standard. We held the International High-Speed Rail Conference on October 22, 2014, in commemoration of the 50th Anniversary of the Tokaido Shinkansen, with IHRA, JR West and JR Kyushu for people in many countries or regions to understand the Japanese high-speed rail system in depth.



First IHRA Meeting (April 10, 2014)

21 The Chuo Shinkansen using the Superconducting Maglev System

We are promoting the Chuo Shinkansen project using the Superconducting Maglev system based on the Nationwide Shinkansen Railway Development Act (the "Act") to continually carry out our mission of operating a high-speed railway that links the Tokyo Metropolitan areas with Nagoya and Osaka and to ensure the future foundation of the company.

To promote this project, we will invest where necessary to ensure safe and reliable transportation and enhance competitiveness as well as ensure sound management and stable dividends. We will also surely and steadily engage in various efforts aimed at the realization of the Chuo Shinkansen first to the City of Nagoya and thereafter to the City of Osaka.

All costs are examined by the internally established "Chuo Shinkansen Construction Cost Reduction Committee," which continues to thoroughly reduce costs whilst ensuring safety. At the same time, we will conduct cost management in a flexible manner so that we can distribute resources in an optimal fashion in accordance with operational status.



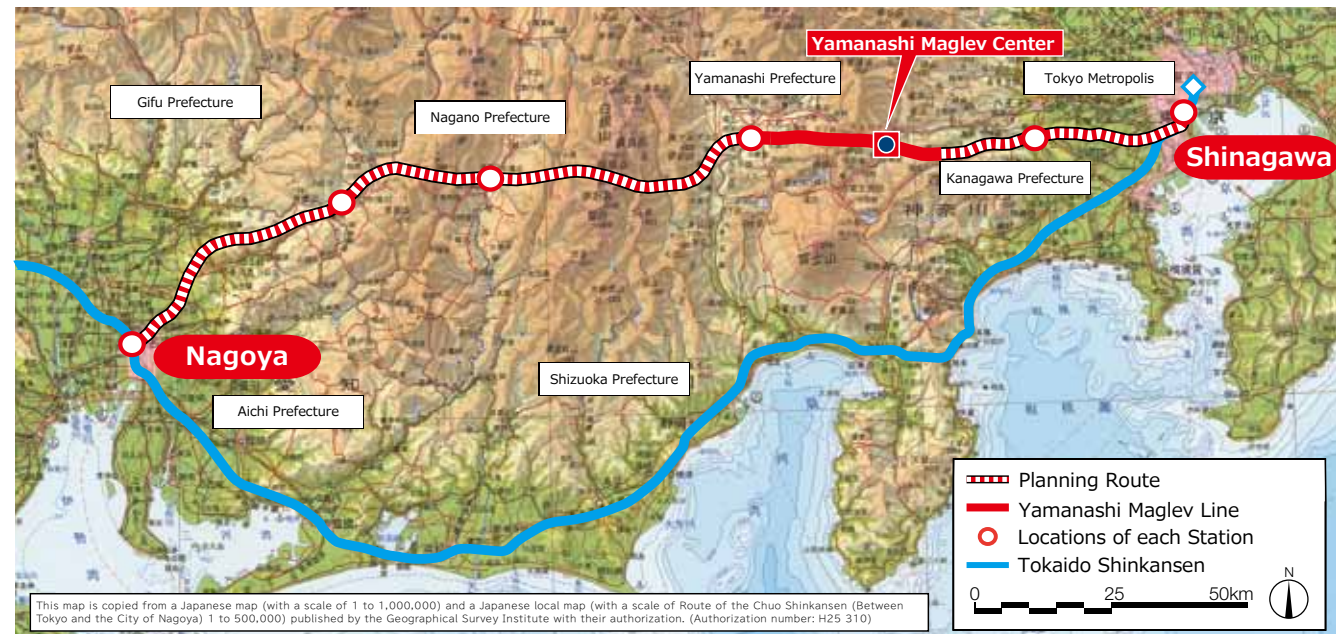
Series L0 (L zero)

Flow of works based on the Nationwide Shinkansen Railway Development Act



Construction safety invocation ceremony (Shinagawa/Nagoya Station), December 17, 2014

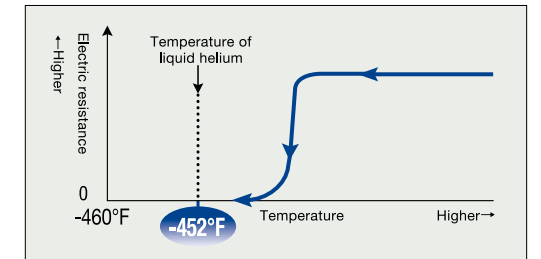
Route of the Chuo Shinkansen (Between Tokyo and the City of Nagoya)



The Principles of the SCMAGLEV System

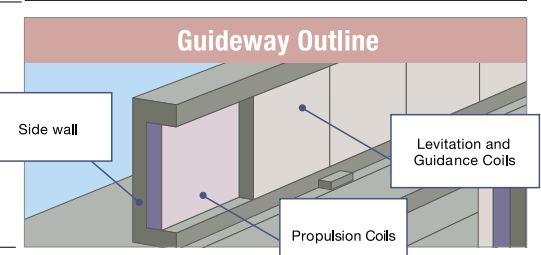
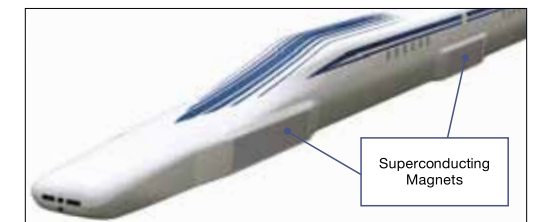
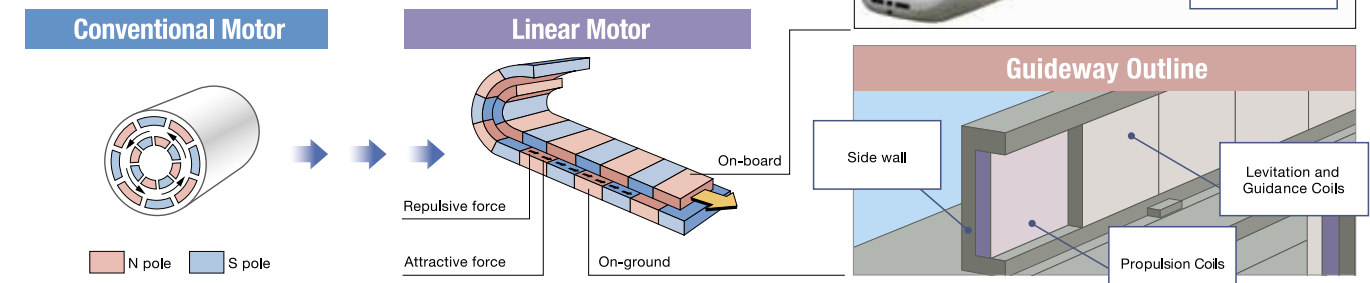
What is Superconductivity?

Superconductivity is the phenomenon that the electrical resistance of certain materials approaches zero at very low temperatures. When an electrical current is applied to a coil in a superconductive state (superconducting coil), this current continues to flow almost indefinitely, resulting in the creation of a very large magnetic field. Niobium-titanium alloy has been used for the Superconducting Maglev and superconductive state is achieved when cooling it with liquid helium to a temperature of minus 452°F.



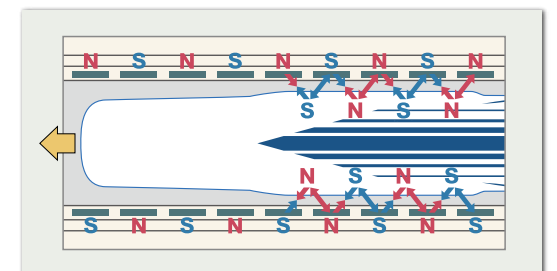
What is a Linear Motor?

A linear motor can be compared to a conventional type of rotating motor which is cut open and extended linearly. The rotors inside the conventional motors correspond to the Superconducting Magnets in the Superconducting Maglev vehicles, while the external stators correspond to the Propulsion Coils on the ground.



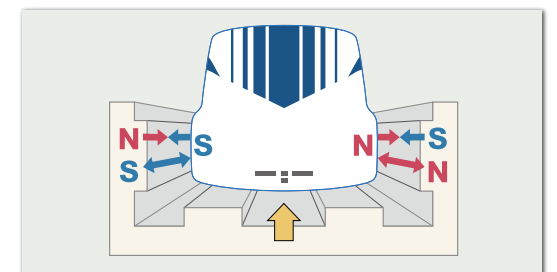
Propulsion System

By passing current through the Propulsion Coils on the ground, a magnetic field (north and south poles) is produced, thus the vehicle is propelled forward by the attractive force of opposite poles and the repulsive force of same poles acting between the ground coils and the Superconducting Magnets built into the vehicles.



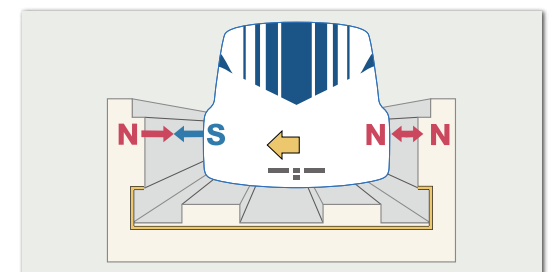
Levitation System

Levitation and Guidance Coils are installed on both sides of the guideway (track). When the on-board Superconducting Magnets pass through at high speed, an electric current is induced in the Levitation and Guidance Coils, causing them to become electromagnets. This generates a force that both pushes and pulls up the vehicle.



Guidance System

The Levitation and Guidance Coils on both sides of the guideway keep the vehicles in the center of the guideway at all times by exerting an attractive force on the further side of the vehicle and a repulsive force on the nearer side when the vehicle moves off center to either side.



22 Rolling Stock

JR Central has introduced faster and more modern rolling stock, which have not only raised passenger comfort but also reduced per-car operating and maintenance expenses.



Series 383 Express EMU

Inauguration	1995
Type of service	Shinano
Maximum speed	130 km/h
Weight (tons/trainset)	213.9
Bogie	Bolsterless type with controlled tilting and self-steering system
Power control system	VVVF (Variable Voltage, Variable Frequency) control



Series 313-5000 Suburban EMU

Inauguration	2006
Type of service	Rapid train service
Maximum speed	120 km/h
Weight (tons/trainset)	205.3
Bogie	Bolsterless type
Power control system	VVVF (Variable Voltage, Variable Frequency) control



Series 85 Express DMU

Inauguration	1989
Type of service	Hida, Nanki
Maximum speed	120 km/h
Weight (tons/trainset)	164.2
Bogie	Bolsterless type
Power control system	—



Series 285 Sleeping Car Express EMU

Inauguration	1998
Type of service	Sunrise Express
Maximum speed	120 km/h
Weight (tons/trainset)	305
Bogie	Bolsterless type with antirolling mechanism
Power control system	VVVF (Variable Voltage, Variable Frequency) control

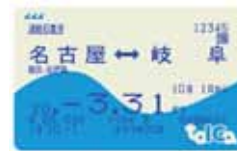
23 TOICA

Our integrated chip (IC) card TOICA allows holders quick and easy access to transit railways and buses as well as the use of electronic money at member stores that accept this form of payment.

2013 — Nationwide mutual integration of conventional line IC card systems allows holders of TOICA to use their cards across 10 networks throughout Japan.



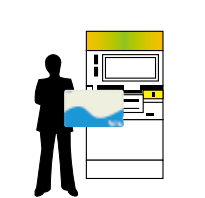
TOICA prepaid SF Card



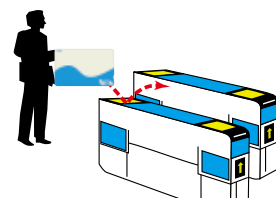
TOICA Commuter pass

Characteristics of TOICA

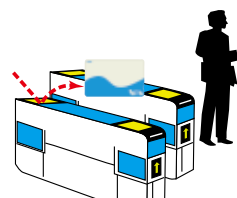
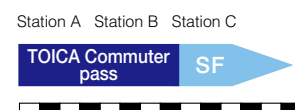
- Simply Touch the Gate (Non-contact IC card)
- Automatic Fare Adjustment
- Repeat Use
- Reissuance of Commuter Passes



Add money to the TOICA



(ENTERING)
Touch the ticket gate



(Leaving)
Touch the ticket gate
Necessary fare is automatically deducted from the TOICA

24 JR Central Research Center ("The Komaki")

Promoting In-House Research and Development

JR Central opened its own original R&D center in Komaki, Aichi Prefecture in July 2002, and is promoting R&D activities to further strengthen our efforts toward technological development that will support our future, to enhance our technical capabilities, and to foster technically skilled human resources. At the Komaki Research Center, we place the highest priority on ensuring safe and reliable transportation. We are also promoting research and development for practical technology for the enrichment of transportation service

and countermeasures for natural disasters, as well as developing technologies linked to cutting costs and improving constraints on construction for large-scale renovation. In addition we are trying to reduce costs and increase efficiency at all levels including saving labor in maintenance work.

We also promote efforts related to more accurate forecast/detection, etc. for extreme weather and major natural disasters.

Vehicle Dynamic Simulator

This simulator is the world's first full-scale device to research train ride comfort. The original characteristic of this device is to regenerate the motion of an actual train with high precision using three kinds of motion systems. The interior of the cabin is the same as an actual Shinkansen train, and views through the windows and running sounds are also reproduced to realize the atmosphere of the cabin. Using this simulator, we are researching train ride comfort for the future and will continue developing comfortable high speed trains.



Rolling Stock Field Test Simulator

The Rolling Stock Field Test Simulator reproduces actual rolling stock running conditions by simulating vibrations caused by aerodynamic force in a tunnel, and by track irregularities and rail roughness, etc. By making the structure of the testing device as rigid as possible, durability tests for various train parts are possible. In these durability tests it is also possible to identify preliminary fault signs. The testing device will contribute to technical developments that will further improve the Tokaido Shinkansen.



Low-Noise Wind Tunnel

In researching the aerodynamic phenomena of high-speed rail, JR Central is the first railway company in Japan to introduce a wind tunnel. This wind tunnel makes it possible to conduct tests for high wind speeds of up to 350km/h. The wind tunnel has high performance, with background noise levels as low as 78dB(A) at wind speeds of 300km/h. Using this low-noise wind tunnel, we will pursue the development of technologies to reduce aerodynamic noise and aerodynamic resistance, to develop rolling stock that offers a quieter and more energy-efficient ride.



Railway Structure Loading Test System

This is a device that tests the effects of the fatigue generated in structures due to Shinkansen operation. Using the actual structures employed for the Tokaido Shinkansen and through the control of three hydraulic jacks, it is possible to conduct tests that duplicate the stress patterns caused by the passing of the Shinkansen rolling stock.



25 SCMAGLEV and Railway Park

JR Central opened the SCMAGLEV and Railway Park in March 2011 in Nagoya in response to a request from the City of Nagoya to participate in the "Monozukuri (manufacturing) Culture Exchange Area Project".

At the SCMAGLEV and Railway Park, we introduced the "progress of the high-speed rail technology" through displays of rolling stocks for the Tokaido Shinkansen, conventional lines and Superconducting Maglev.

In May 2015, the number of visitors reached the 3 million mark. We are making an effort to improve the general public's



understanding of the railway and contribute to the promotion of industrial tourism by planning events, advertising the Park, and offering products linked with Nagoya region tourism to attract even more visitors.

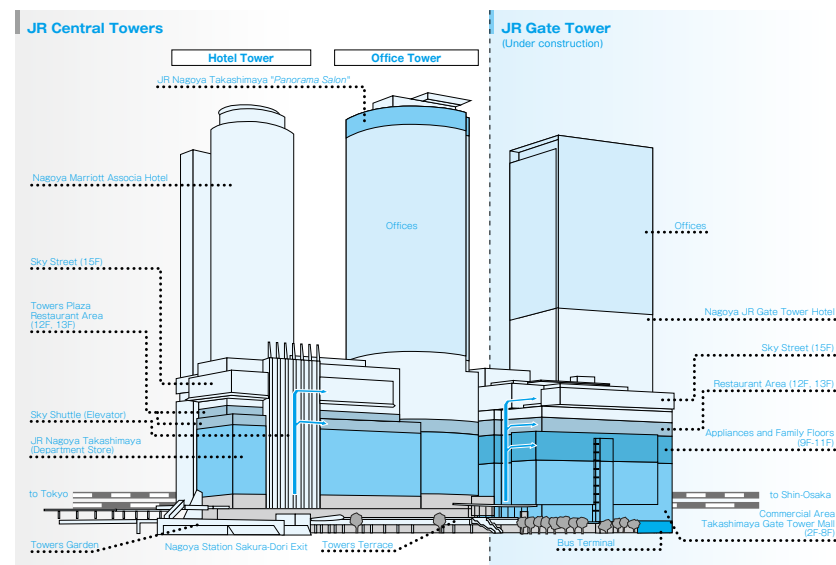


26 JR Central Towers and JR Gate Tower Project

JR Central has been developing a complex JR Gate Tower next to JR Central Towers, which is located directly above Nagoya Station where offices, a hotel, commercial facilities and a parking lot are being planned.

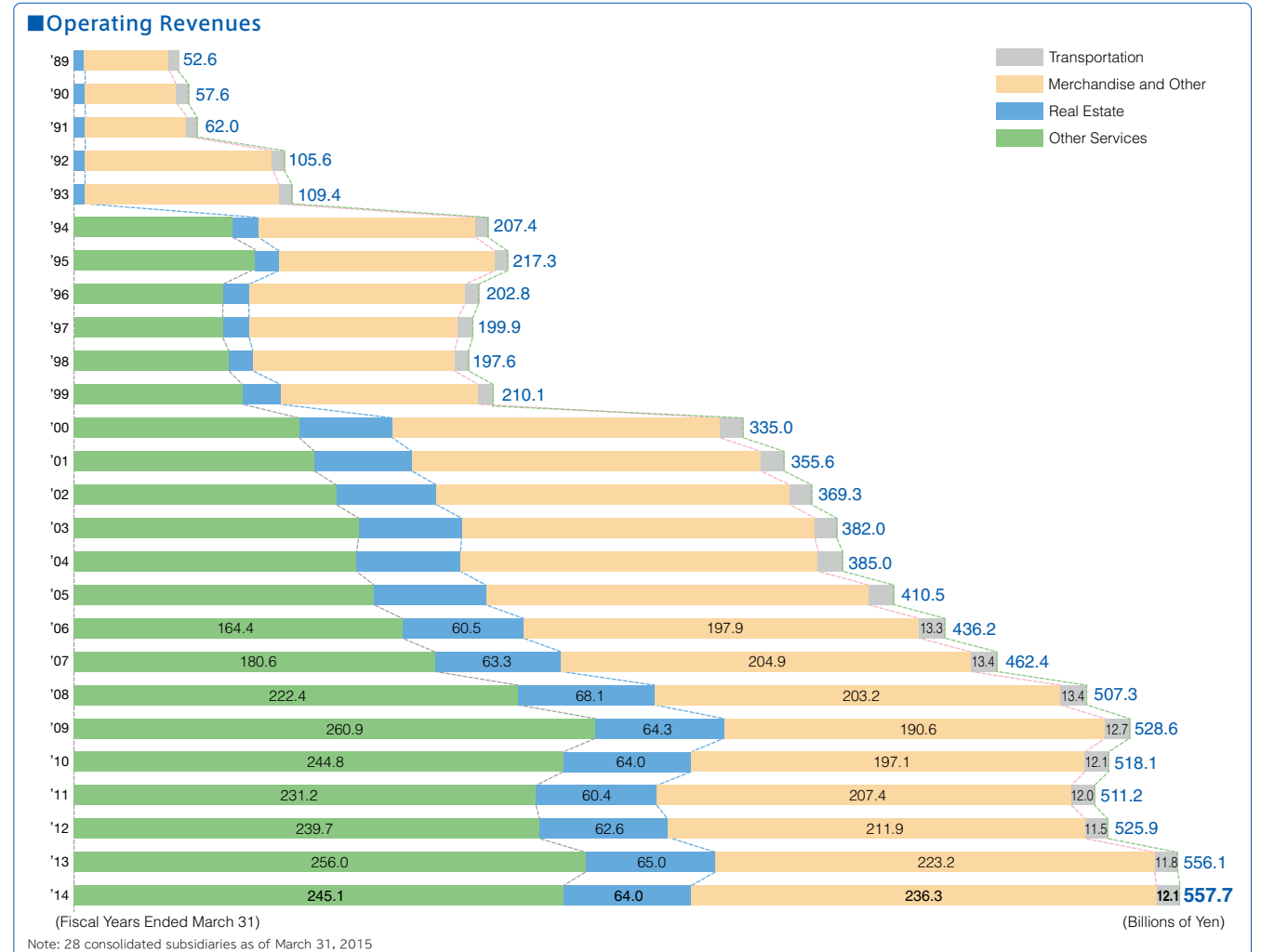
Plan Concept

- Creating an attractive and convenient cosmopolitan space that is unified with JR Central Towers with the intention of creating a bustling hotspot for the area around Nagoya Station.
- Giving the office complex metropolitan functions that are fitting of it and meeting the diverse working style needs of the community around Nagoya Station.
- Forming a relaxing cosmopolitan space that considers reducing the burden on the environment by utilizing natural energy, etc.



27 Consolidated Subsidiaries

JR Central promotes many affiliated businesses through its subsidiaries to maximize operating efficiency and flexibility.



Real Estate

- JR Central Building Co., Ltd.
Owner of JR Central Towers and JR Gate Tower



- JR Tokai Real Estate Co., Ltd.
- Shin-Yokohama Station Development Co., Ltd.
- Toyohashi Station Building Co., Ltd.
- Tokyo Station Development Co., Ltd.
- Shizuoka Terminal Development Co., Ltd.
- Hamamatsu Terminal Development Co., Ltd.
- Nagoya Station Area Development Corporation
- JR Development and Management Corporation of Shizuoka
- JR Development and Management Corporation of Kansai

Merchandise and Other

- JR Tokai Takashimaya Co., Ltd.
Operator of JR Nagoya Takashimaya Department Store



- JR Central Passengers Co., Ltd.
- Tokai Kiosk Company
- JR Tokai Food Service Co., Ltd.
- JR Tokai Corporation

Transportation

- JR Tokai Bus Company
- JR Tokai Logistics Company
- Tokai Transport Service Company

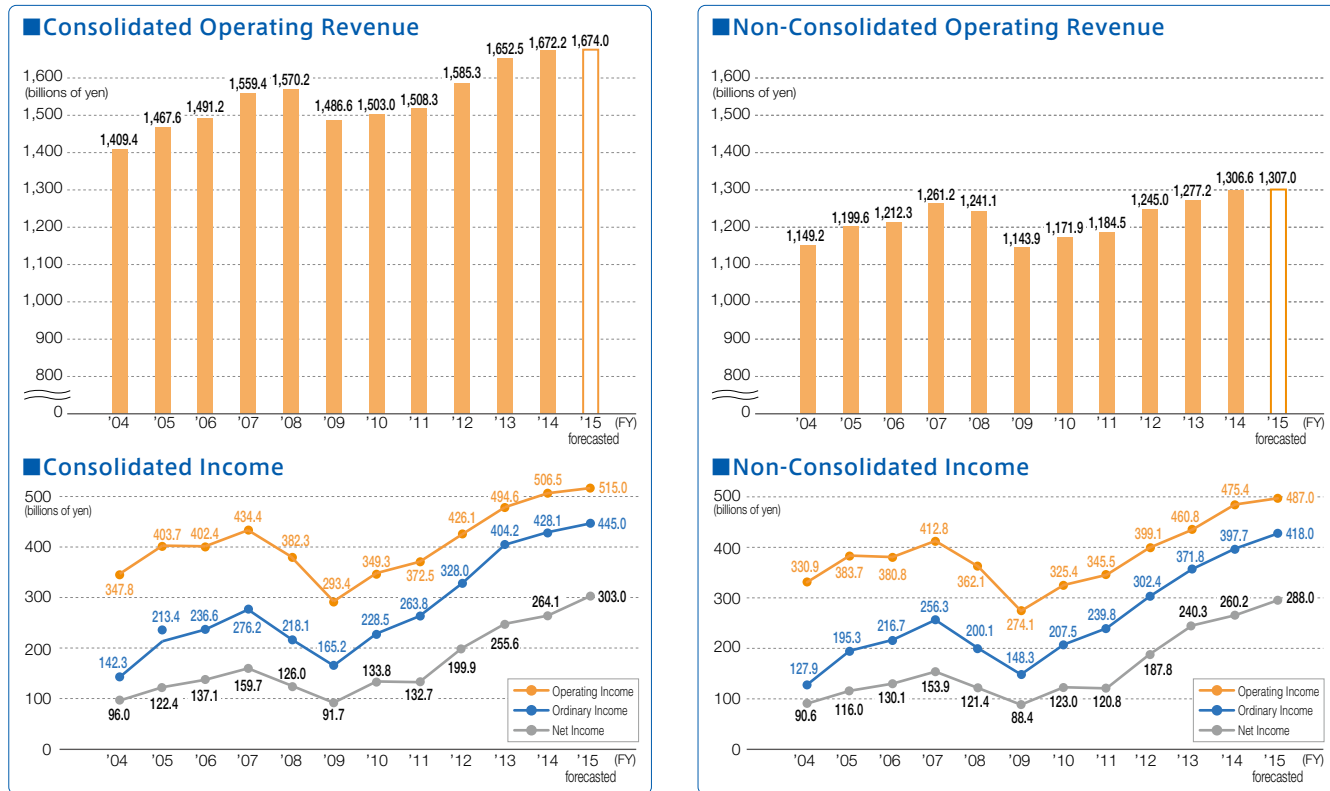
Other

- JR Tokai Hotels Co., Ltd.
Operator of Nagoya Marriott Associa Hotel and Nagoya JR Gate Tower Hotel



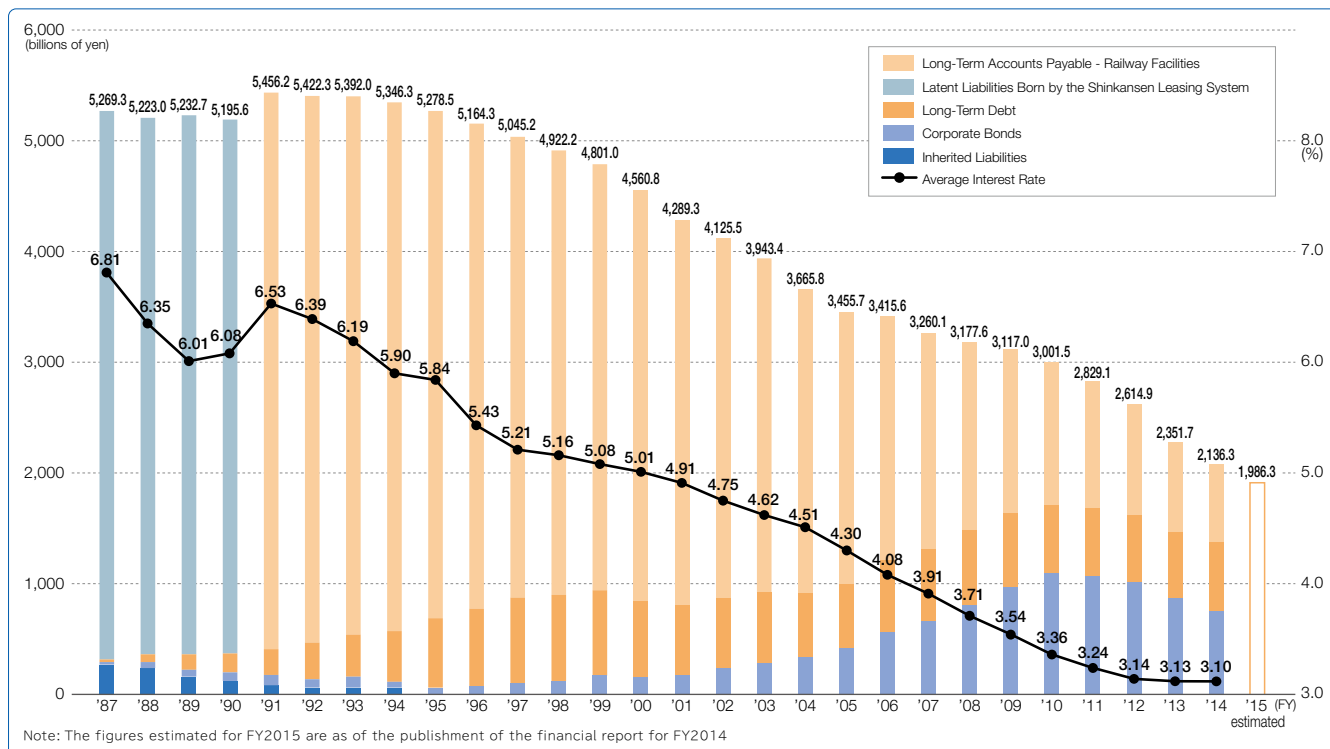
- JR Tokai Tours
- JR Tokai Agency Co., Ltd.
- Nippon Sharyo, Ltd.
- JR Tokai Construction Co., Ltd.
- Chuoh Linen Supply Co., Ltd.
- JR Tokai Information Systems Company
- The Japan Mechanised Works and Maintenance of Way Co., Ltd.
- Tokai Rolling Stock & Machinery Co., Ltd.
- JR Central Consultants Company

28 Financial Results



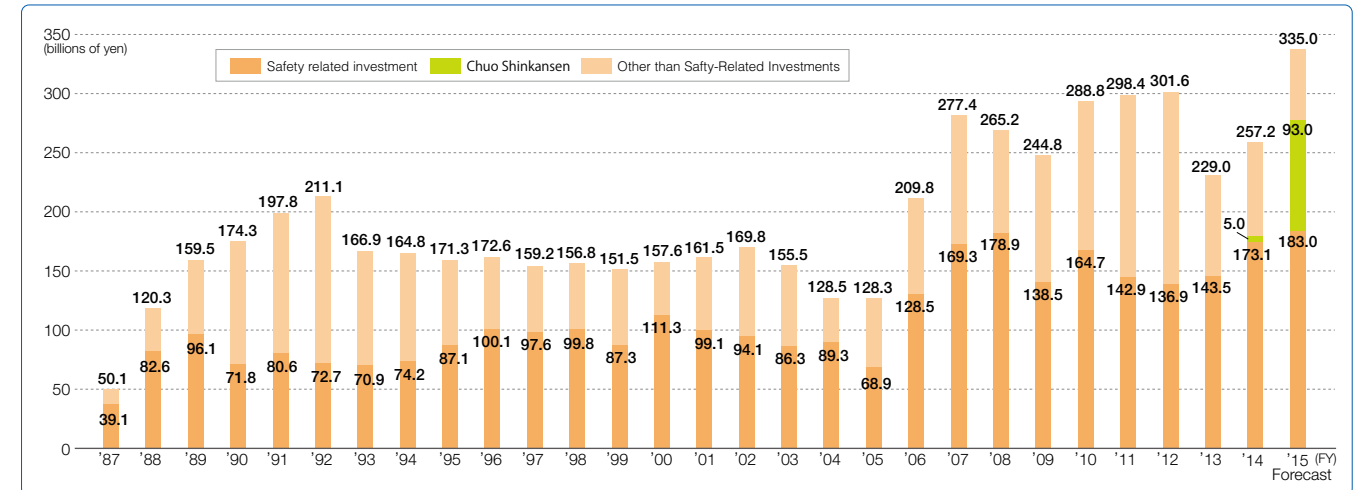
Note: The figures forecasted for FY2015 are as of the publication of the financial report for FY2014

29 Total Long-Term Debt and Payables (Non-Consolidated)

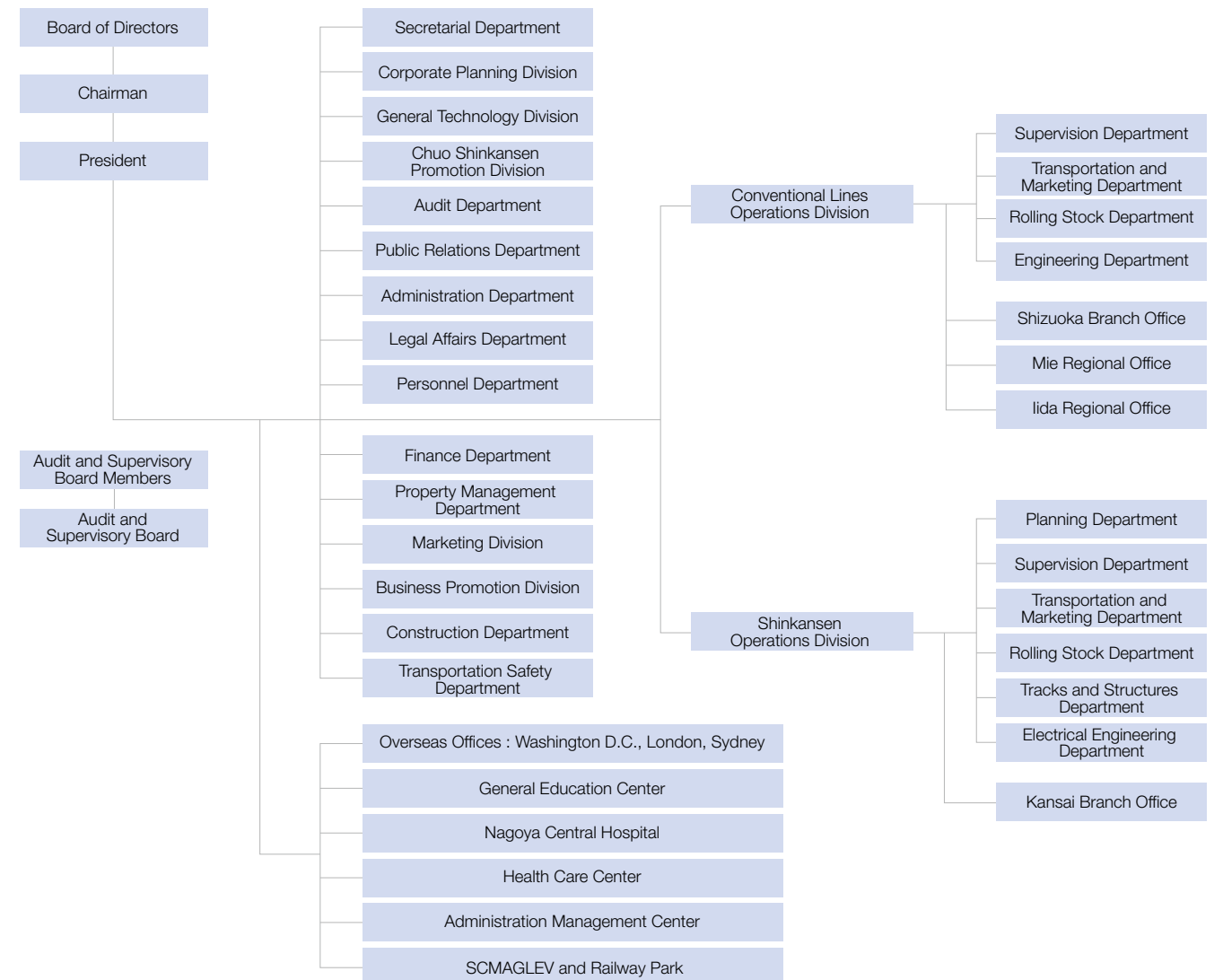


Note: The figures estimated for FY2015 are as of the publication of the financial report for FY2014

30 Trends in Capital Investment



31 Organization Chart



32 History of JR Central

- 1987** April ● Central Japan Railway Company (JR Central) is established.
- 1988** March ● New stations are established on the Tokaido Shinkansen (Shin-Fuji, Kakegawa, Mikawa-Anjo). ● JR Tokai Bus Company is established (now a consolidated subsidiary). In April automobile transport business is transferred to the company.
- 1989** March ● New-model DMU is introduced to the "Hida" Express on the Takayama line.
- 1990** February ● JR Central starts topographical and geological surveys along the entire proposed route of the Chuo Shinkansen following order from the Minister of Transport.
June ● JR Central applies to the Minister of Transport for the approval of plans to build the Yamanashi Maglev Line and approval is received.
- 1991** October ● JR Central takes over the Tokaido Shinkansen facilities.
- 1992** March ● The first "Nozomi" (Series 300) begins commercial operation on the Tokaido Shinkansen.
July ● JR Tokai Hotels Co., Ltd. is established (now a consolidated subsidiary).
December ● JR Central Department Store Co., Ltd. is established. Company name changed to JR Tokai Takashimaya Co., Ltd. in September 1997 (now a consolidated subsidiary).
- 1994** June ● JR Central Building Co., Ltd. is established (now a consolidated subsidiary).
- 1997** April ● Running tests start on the Yamanashi Maglev Line.
October ● JR Central lists on the first section of the Nagoya, Tokyo and Osaka stock exchanges (integrated with the Tokyo Stock Exchange in July 2013) and also the Kyoto Stock Exchange (merged with the Osaka Stock Exchange in March 2001).
- 1999** March ● Series 700 is introduced to "Nozomi" on the Tokaido Shinkansen.
December ● Construction of JR Central Towers is completed.
- 2000** March ● JR Nagoya Takashimaya opens (operated by JR Tokai Takashimaya Co., Ltd.).
May ● Nagoya Marriott Associa Hotel opens (operated by JR Tokai Hotels Co., Ltd.).
- 2001** March ● JR Tokai Real Estate Co., Ltd. is established (now a consolidated subsidiary).
December ● JR Central is excluded from the jurisdiction of the JR Law through the enactment of amendment to the JR Law.
- 2002** July ● A new research center is constructed in Komaki City in Aichi Prefecture.
- 2003** October ● Shinagawa Shinkansen Station opens. The timetable is drastically revised by the upgrading of the maximum speed on all Tokaido Shinkansen trains to 270km/h.
- 2005** July ● The Japan National Railways (JNR) Settlement Headquarters, an independent division within the Japan Railway Construction, Transport and Technology Agency (JRJT), sells 600,000 shares in JR Central.
- 2006** March ● New Automatic Train Control (ATC) system is introduced into the Tokaido Shinkansen.
April ● The JNR Settlement Headquarters within the JRJT completes the sale of its entire shares in JR Central by selling 286,071 shares of common stock of the company.
- 2007** January ● Application for changes of "Yamanashi Line Construction Plan" is approved by the Minister of Land, Infrastructure and Transport.
July ● JR Central introduced the new Series N700 for "Nozomi" services.
- 2008** October ● JR Central made Nippon Sharyo, Ltd. a consolidated subsidiary.
● JR Central submitted a report to the Minister of Land, Infrastructure, Transport and Tourism (the "Minister") concerning topographical and geological surveys of the Chuo Shinkansen.
December ● JR Central started to conduct four surveys related to the Chuo Shinkansen received from the Minister.
- 2009** December ● JR Central submitted a report to the Minister concerning the four surveys related to Chuo Shinkansen which we received instructions to implement from the Minister in 2008.
- 2011** May ● The Minister designated JR Central as the operator and constructor of the Chuo Shinkansen between Tokyo and Osaka City.
● The Minister approved the development plan and instructed JR Central to construct the Chuo Shinkansen.
- 2013** February ● JR Central introduced the new N700A for "Nozomi" services.
August ● Completed the extension of the Yamanashi Maglev Line to 42.8km and upgrade facilities and restarted running test
- 2014** October ● The 50th anniversary of the Tokaido Shinkansen
● The Minister approves the Construction Implementation Plan (Part 1) between Shinagawa and Nagoya along the Chuo Shinkansen.
- 2015** March ● The Taketoyo Line (between Obu and Taketoyo stations) is electrified.
● Increase of the maximum speed of the Tokaido Shinkansen to 285km/h.



April 1, 1987
Establishment of JR Central



October 8, 1997 Shares are listed on the Nagoya, Tokyo, Osaka, and Kyoto Stock Exchanges



December 20, 1999
Construction of JR Central Towers is completed



October 1, 2003
Shinagawa Shinkansen Station is opened



November 22, 2012 The new vehicle Series L0 (L zero) is carried in the Yamanashi Line



October 1, 2014
Departing ceremony of the 50th anniversary of the Tokaido Shinkansen

33 Corporate Data

Company Name

Central Japan Railway Company (JR Central)

Established

April 1st, 1987

Business

Railways business, Related businesses

Basic Information on a Non-consolidated Basis (as of the end of March 2015)

Paid in Capital	¥ 112 billion
Operating Revenues	¥ 1,306.6 billion
Number of Shares Outstanding	206 million
Share Listings	Nagoya and Tokyo
Number of Shareholders	95,949
Number of Employees	18,231
Operating Kilometers	1,970.8 km
Number of Stations	405
Number of Rolling Stock	4,890
Double-and Multi-Tracked Section	55.1% (1,086.8km)
Electrified Section	76.7% (1,511.0km)
Centralized Traffic Control	97.5% (1,922.3km)
Automatic Signaling System	97.8% (1,927.3km)

Locations

Head Office

JR Central Towers, 1-1-4, Meieki, Nakamura-ku, Nagoya, Aichi 450-6101, Japan

Tokyo Head Office

JR Central Shinagawa Building -A Wing, 2-1-85, Konan, Minato-ku, Tokyo 108-8204, Japan

Conventional Lines Operations Division

JR Central Taiko Building, Meieki 1-3-4, Nakamura-ku, Nagoya, Aichi 453-8520, Japan

Shizuoka Branch Office

4, Kurogane-cho, Aoi-ku, Shizuoka, Shizuoka 420-0851, Japan

Mie Regional Office

Ust-Tsu 12F, 700, Hadokoro-cho, Tsu, Mie 514-0009, Japan

Iida Regional Office

5356, Kami-Iida, Iida, Nagano 395-0000, Japan

Shinkansen Operations Division

Marunouchi Chuo Building, 1-9-1, Marunouchi, Chiyoda-ku, Tokyo 100-0005, Japan

Kansai Branch Office

Shin-Osaka Hankyu Building 10F, 1-1-1, Miyahara, Yodogawa-ku, Osaka, Osaka 532-0003, Japan

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Sydney Office

Suite 5.01A, Level5, 20 Hunter Street, Sydney, NSW 2000, Australia
Tel: +61-2-9221-6922 Fax: +61-2-9221-6933

34 Conversion Tables

Kilometers		Miles	
Kilometers	Miles	Kilometers	Miles
10	6	50	31
20	12	100	62
30	19	150	93
40	25	200	124
50	31	250	155
60	37	300	186
70	44	350	218
80	50	400	249
90	56	450	280
100	62	500	311
110	68	550	342
120	75	600	373
130	81	650	404
140	87	700	435
150	93	750	466
160	99	800	497
170	106	850	528
180	112	900	559
190	118	950	590
200	124	1,000	622
210	130	1,100	684
220	137	1,200	746
230	143	1,300	808
240	149	1,400	870
250	155	1,500	932
260	161	1,600	994
270	168	1,700	1,057
280	174	1,800	1,119
290	180	1,900	1,181
300	186	2,000	1,243

Maximum Speed

Tokaido Shinkansen (Operation)

285km/h=177mph

Shinkansen (N700-I)

330km/h=205mph

SC Maglev (Operation)

500km/h=311mph

SC Maglev (Test Record)

603km/h=375mph

Commercial Distance

Tokyo to Nagoya

366.0km=227miles

Tokyo to Shin-Osaka

552.6km=343miles

Washington, DC to New York (Amtrak)

362.0km=225miles

New York to Boston (Amtrak)

371.7km=231miles

Miles		Kilometers	
Miles	Kilometers	Miles	Kilometers
10	16	50	80
20	32	100	161
30	48	150	241
40	64	200	322
50	80	250	402
60	97	300	483
70	113	350	563
80	129	400	644
90	145	450	724
100	161	500	805
110	177	550	885
120	193	600	965
130	209	650	1,046
140	225	700	1,126
150	241	750	1,207
160	257	800	1,287
170	274	850	1,368
180	290	900	1,448
190	306	950	1,529
200	322	1,000	1,609
210	338	1,100	1,770
220	354	1,200	1,931
230	370	1,300	2,092
240	386	1,400	2,253
250	402	1,500	2,414
260	418	1,600	2,574
270	434	1,700	2,735
280	451	1,800	2,896
290	467	1,900	3,057
300	483	2,000	3,218

