

Stable Growth through Expansion Based on Tokaido Shinkansen

Central Japan Railway Company (JR Central)

Company Foundation and Business Trends

JR Central was established in April 1987 when Japanese National Railways (JNR) was broken up and privatized. A principal role of the new company is to maintain and develop the Tokaido Shinkansen, the main transport artery linking Tokyo, Nagoya and Osaka, as well as to provide local transportation in the urban areas around Nagoya and Shizuoka. In the following 20 years, we have done our utmost to ensure customer satisfaction by providing convenient and comfortable services based on an integrated approach to the railway business, and with safety and provision of a stable transport service as our top priority. We have also worked to achieve efficient operations across all our business activities and to maintain a healthy relationship between management and labour.

The Tokaido Shinkansen is the major source of our revenues, and when the company was established, the national economy was strong and transport volumes in general were growing steadily. However, the boom years in Japan were soon followed by recession, and combined with strong competition from other companies, the business climate became very difficult. In this context, we launched the *Nozomi* shinkansen—service frequencies were raised gradually and revenues increased coupled with aggressive marketing tactics. Ever since privatization, we had been working on opening a new Tokaido Shinkansen terminal at Shinagawa Station and this finally opened for business on 1 October 2000. Building the new terminal and upgrading the operating speed of all our shinkansen to 270 km/h allowed a radical timetable revision and the improved speed and convenience created what some passengers called a ‘rebirth’ of the shinkansen. The recovery in the Japanese economy since 2003 has helped transport volumes on the Tokaido Shinkansen to grow steadily, reaching 43.8 billion passenger-km in FY2005—1.4 times more than in 1987.

During the last 20 years we have also made great efforts to strengthen our financial position; long-term liabilities of ¥5.5 trillion inherited after the dissolution of the Shinkansen Lease System in October 1991 have been paid down to ¥3.5 trillion at the end of FY2005. JR Central was listed on the Tokyo Stock Exchange in October 1997 and the government sold all its remaining shares in the company in April 2006.

Safe and Stable Transport

Ensuring safe and stable transport is the fundamental principle of all JR Central operations. Based on the recognition that safety is the most important duty of a transport business, we have improved and strengthened our safety facilities by consolidating and investing in our safety systems and taking systematic safety measures every year. To complement these measures, we educate our employees to understand the importance of always putting safety first and strictly complying with laws and regulations using training programmes to develop safety awareness skills.

Since 1987, we have allocated about 60% of our investment in safety equipment and have systematically introduced new infrastructure. For example, we have established a new Stand-by Operation Control Center for the Tokaido and San’yo shinkansen, introduced ATC (Automatic Train Control) systems, introduced and improved the Tokaido Shinkansen Earthquake Rapid Alarm System (TERRA-S), and strengthened the seismic resistance of viaduct pillars and ground. We have also been improving facilities on conventional narrow-gauge lines where we have introduced CTC (Centralized Traffic Control), PRC (Programmed Route Control) and electronic interlock systems, improved ATS (Automatic Train Stop) systems and railway crossing safety equipment, strengthened the seismic resistance of viaduct pillars and ground, and upgraded train safety equipment. As a result, accidents on JR Central lines in FY2005 dropped by more than 60% compared to the number at privatization.

Railway Operations

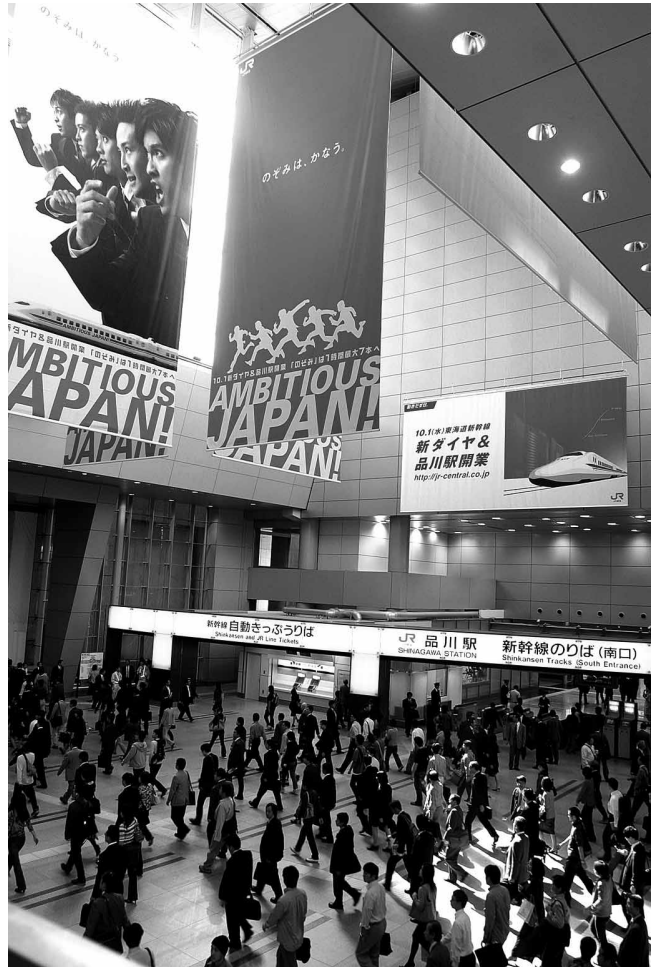
Tokaido Shinkansen

Tokaido Shinkansen services were greatly upgraded by quickly replacing the inherited and aging Series 0 shinkansen with Series 100 train sets. Combined with the favourable economic conditions at the time, transport volumes grew too. For example, *Hikari* shinkansen achieved a daily seat load factor of 99% in non-reserved cars and we responded by increasing the number of cars and improving facilities. Services were expanded too—in March 1989, the number of hourly *Hikari* services was increased from six to seven, and then again to eight in March 1992. However, we soon reached our capacity limit, and despite improvements still did not have enough capacity to meet future needs. For this reason, we decided to proceed with a radical plan for improving the transport capacity of the Tokaido Shinkansen, which included construction of a new shinkansen terminal at Shinagawa.

Since most journeys on the Tokaido Shinkansen are made by business travellers, we realized that if we wanted to continue our role as one of the most important transport companies in the Japanese economy, we needed to improve the time 'value' for customers. In other words, it was essential that we shorten journey times by increasing train speeds and we immediately devoted a lot of effort to increasing train speeds because it was the most crucial issue we faced along with expanding our transport capacity. The March 1992 timetable revision saw the start of the *Nozomi* service with Series 300 trains running at maximum speeds of 270 km/h. The timetable was revised again in 1993 to increase the number of *Nozomi* trains to one every hour and extend direct service to Hakata Station on the San'yo Shinkansen. The start of the *Nozomi* services cut journeys, with times between Tokyo and Shin-Osaka reduced to 2.5 hours.



Trains used in 20 years on Tokaido Shinkansen (from left—Series 0, Series 100, Series 300, Series 700)



Opening of Shinagawa Station and upgrading of all shinkansen trains to 270 km/h as 'rebirth' of Tokaido Shinkansen

Investment in the Series 300 continued as ground equipment was improved, enabling further expansions in *Nozomi* services and an increase in the number of trains stopping at Shin-Yokohama Station. The March 1999 timetable revision supported the start of Series 700 *Nozomi* services, offering greater comfort and better environmental performance, and the October 2001 timetable revision saw *Nozomi* trains running every 30 minutes.

Finally, the radical timetable change on 1 October 2003 reflected the start of shinkansen services running from the new Tokaido Shinkansen terminal at Shinagawa Station and the speed upgrade to 270 km/h for all trains and enabled a maximum of seven *Nozomi* services an hour. This timetable change was not a minor revision, but was a complete transformation in service quality by creating a new gateway and hub for the huge Tokyo market to complement our existing terminals at Tokyo and Shin-Yokohama stations. Not only did this greatly improve convenience for customers, it also played a key role in redeveloping the area around Shinagawa Station. In addition, to provide transport for the 2005 World Exposition, Japan (Aichi Expo), peak capacity was

increased by running eight *Nozomi* services every hour. The convenience was also improved by increasing the number of *Nozomi* services linking directly with the Tokaido and San'yō main lines, establishing flexible services for the periods and time slots when most customers were travelling.

Conventional lines

JR Central's conventional lines form a fully integrated network with the Tokaido Shinkansen. In addition to feeder functions, the conventional lines contribute to local development in central Japan, especially around Nagoya and Shizuoka. Right from JR Central's first days, the company has been committed to upgrading services on conventional lines by introducing new train models, increasing speeds and service frequency, and fully air-conditioning all trains. As a result, passenger volumes are 20% higher than at privatization.

New wide rolling stock has been introduced for limited express services to increase passenger comfort and limited-express timetables have been coordinated with shinkansen services to form an integrated 'wide-view' limited express network.

Meanwhile, more conventional services are being operated, especially during morning and evening peaks, and addition of new rapid-service trains has shortened journeys. Furthermore, timetables with trains departing at regular intervals are more user friendly; the October 2006 timetable revision saw large-scale introduction of new Series 313 rolling stock on the Tokaido main line, dramatically improving rapid services.

Marketing

We have worked hard in the years since privatization to strengthen our basic marketing for the Tokaido Shinkansen with many activities, including the development of in-office ticket printers for corporate customers with a JR Central account. Since the *Nozomi* services started in March 1992, we have taken a flexible approach to providing customers with new offers centred on *Nozomi*. For example, in autumn 1993, we started a special Kyoto and Nara campaign to stimulate tourist demand.

In September 2001, we introduced an Express Reservation system making full use of modern IT advances and allowing customers to freely book or change seat reservations without waiting at the station counter. Customers can significantly shorten their

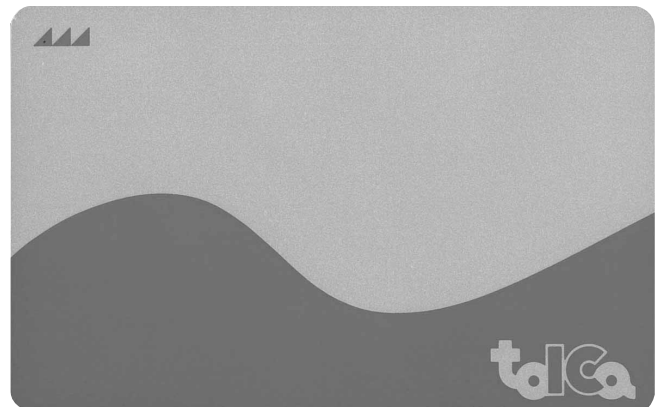


Express Reservation IC Service scheduled for FY2008

total travel times because booked tickets are picked up from a station ticket machine; in July 2006, the service was expanded to cover all lines in the Tokaido and San'yō shinkansen service areas. In FY2008, we will introduce an Express Reservation IC Service, eliminating the need to use ticket machines and making boarding a Tokaido Shinkansen even smoother.

We have also made radical changes to fares, such as reducing the price of *Nozomi* tickets at the major timetable overhaul in October 2003. In another marketing drive, we started a travel club for people aged 50 and over, called the 50+ Travel Club, offering free travel information, and guided tours. By the end of FY2005, this club had grown to 370,000 members.

We also launched a variety of special promotions on conventional lines as well, such as the Nature Walk campaign, helping promote use of conventional lines and boosting revenues. November 2006 saw the launch of TOICA, an IC card ticket service, in the Nagoya area, which was extended to the Shizuoka region in FY2007.



The TOICA card launched around Nagoya in November 2006 was expanded to the Shizuoka area in FY2007.

Expansion of Affiliated Businesses

JR Central made great efforts to create a strong foundation for affiliated businesses, so they can be managed responsively, flexibly and with clear responsibility. We have concentrated on maximizing use of station real estate, such as redeveloping station buildings, and have been involved in further business expansions, focusing on fields where we can expect a synergistic effect with our railway business. As a result, in FY2005, the total unconsolidated operating profits of all affiliated companies under the JR Central umbrella were eight times higher than in FY1989.

In particular, the May 2000 full opening of JR Central Towers in Nagoya was a crucial step for the company. This very large project had been underway since 1987, and was pivotal in developing affiliated businesses. JR Central Towers holds the Guinness record as the world's



JR Central Towers—focus of affiliated businesses

largest railway station where three JR Central affiliates have developed businesses including department stores, hotels and offices—the Towers are now an instantly recognizable landmark. Their ability to attract customers has had the positive effect of increasing railway passengers. In FY2005, the three Towers affiliates had a combined operating profit of ¥134 billion, or about 30% of the operating profit for all consolidated affiliates. It is clear that the opening of JR Central Towers dramatically increased operating profits.

In other business fields, we have been building commercial facilities on old company housing sites, developing apartments and residential buildings, renewing shops in stations in parallel with improving main-station facilities, and are starting construction of the new JR Tokaido Shin-Yokohama Station Building (provisional name).

Technological Developments

Technology is the basis of all new railway developments and JR Central has been taking steps to develop new technologies. As the result of our R&D, we have been able to introduce more advanced technology. Reflecting these efforts, we established the 300X Development Project—our first dedicated R&D team—in July 1990. In February 1995, the team started runs of 300X test trains, achieving a speed of 443.0 km/h in July 1996, the second-highest train speed ever recorded. The experience and technical skills acquired through this project were the driving force behind subsequent development of the Series 700 and N700.

In July 2002, we opened our own independent research facility in Komaki City, Aichi Prefecture, to further strengthen our technological developments to support future growth and to improve technical skills and provide training for personnel. The Komaki facility performs active R&D based on two main concepts of Perfecting Railway Technology and Expanding to New Fields. Activities related to the first concept address issues involved in increasing JR Central’s competitiveness. Activities for the second concept include basic research in fields related to practical application of potential materials, such as photocatalysis and diamond electrodes, as well as research in new fields using superconductivity technology developed during maglev research.

Maglev Activities

As a long-term project, JR Central has been closely involved in developing technology for fast and safe superconducting maglev trains, which we expect to be a key means of maintaining competitiveness in 21st century transport. We constructed the Yamanashi Maglev Test Line based on



Practicality of maglev basic technology has been established

our Fundamental Plan for Technical Development, and the Construction Plan for Yamanashi Maglev Test Line approved by the Minister of Transport in June 1990. April 1997 saw the start of testing in earnest over the completed first stage of the 18.4-km line. A new, world-record, manned, train speed of 581 km/h was set in December 2003. The Maglev Technological Practicality Evaluation Committee of the Ministry of Land, Infrastructure and Transport formally acknowledged, in March 2005, that the practicality of the basic technology had been established. The next goal was to progress by upgrading the basic technology to a practical level and then checking these practical specifications by extending the test line and establishing a maintenance system. To achieve these aims, in September 2006, we finalized an equipment investment plan to upgrade the Yamanashi Maglev Test Line equipment and extend the line to regular railway areas.

As a sign of public enthusiasm for maglev, the JR Central Maglev Pavilion at the 2005 Aichi Expo drew over 6.9 million visitors.

Environmental Activities

Trains have always been an environment-friendly transport mode. In a journey between Tokyo and Osaka, the Tokaido Shinkansen releases just 10% of the CO₂ emissions of an aeroplane, making the shinkansen an efficient mode in terms of environmental conservation. At JR Central, we are developing and introducing low-energy trains to further reduce the environmental burden of trains. We are also taking the lead in promoting use of trains by making our service more attractive to customers, helping lessening environmental damage.

Reduction of Long-term Liabilities

When JNR was first privatized, a Shinkansen Lease System was established for the three JR railway operators on Honshu as a revenue adjustment measure. However, this system was soon found to have inherent problems, such as unfair distribution of financial burdens, defects in earnings retention for maintaining and upgrading infrastructure, and a lack of clarity in asset ownership when debts are repaid. We worked to correct these defects immediately after our company was founded and the lease system was dissolved in 1 October 1991. We inherited ¥319.1 billion of JNR's long-term liabilities calculated at privatization in April 1987. Added to that was ¥5.0956 trillion in assets and liabilities from the Tokaido Shinkansen, leaving us with huge long-term liabilities of ¥5.5 trillion—a figure of more than five times our annual revenues. Consequently, improving our financial position was a top priority, so we worked hard to reduce long-term liabilities by increasing profitability and cutting costs. As a result, the balance of consolidated long-term liabilities at the end of FY2005 was ¥3.5455 trillion, meaning we have cut our liabilities by about ¥2 trillion.

Public Listing and Government-Held Share Sell Off

Public listing was a JR Central obligation under the terms of the JNR privatization. To achieve this goal, we put a great deal of effort into maintaining safe and stable transport, improving services, making operations more efficient, and tackling mid and long-term management issues. As a result, on 8 October 1997, JR Central was listed on four stock exchanges in Nagoya, Tokyo, Osaka, and Kyoto.

On 1 December 2001, legal amendments made conditions right for a sell-off of government-held shares in JR Central. In July 2005, the Japan Railway Construction, Transport and Technology Agency (JRJT) sold 600,000 of its JR Central shares followed by the last 286,000 shares in April 2006.

Conclusion

The above-described activities and the support of our loyal customers over the last 20 years have succeeded in securing stable growth.

In the future, we will continue to put priority on safe and stable transport, while striving to further improve services and attract more customers. We will work to make our operations more efficient and strengthen our financial position. We take our social duty to maintain and expand the transport network that fully integrates the Tokaido Shinkansen with local lines around Nagoya and Shizuoka seriously, and know we must provide a stable service over the long term, building on past successes.

As part of this strategy, we have been improving our transport infrastructure. For example, on 1 July 2007, we started running new Series N700 trains. We are also studying other radical measures to sustain and develop the Tokaido Shinkansen in the future, such as enhancing power equipment, adding a new platform at Shin-Osaka Station, and our long-term goal of achieving commercial operation of maglev trains.



N700 Series debuted on 1 July 2007

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JR Central Chronology

1987

- 15 Jun — Launched insurance broking business
- 20 Jul — Established Magnetic Levitation Division
- 1 Aug — Launched overseas travel business

1988

- 13 Mar — Opened stations at Shin-Fuji, Kakegawa, and Mikawa-Anjo on Tokaido Shinkansen
- 1 Apr — Transferred bus operations to JR Tokai Bus Company
- 20 Sep — Started in-office ticket printer service
- 16 Nov — Opened Mikawa-Shiotsu Station on Tokaido Line

1989

- 9 Mar — Installed leaky coaxial cables on Tokaido Shinkansen
- 11 Mar — Started wide-view *Hida* Express service
- 1 Jun — Launched JR Central Express Card service
- 7 Aug — Decided to construct Yamanashi Maglev Test Line
- 16 Dec — Installed CTC (Centralized Traffic Control) on Gotemba Line

1990

- 6 Feb — Received instructions for topographical and geological surveys along entire course of proposed Chuo Shinkansen from Minister of Transport
- 25 Jun — Received approval from Minister of Transport for Yamanashi Maglev Test Line construction plan
- 28 Nov — Started work on Yamanashi Maglev Test Line

1991

- 16 Mar — Opened *Asagiri* limited express on Gotemba Line
- 21 Apr — Opened Sakuma Rail Park
- 1 Oct — Purchased Tokaido Shinkansen infrastructure
- 14 Dec — Opened Toyodacho Station on Tokaido Line

1992

- 15 Feb — Introduced automatic ticket gates on conventional lines
- 14 Mar — Opened *Nozomi* services with introduction of Series 300 trains on Tokaido Shinkansen
Debuted wide-view *Nanki* limited express
Completed UrEDAS (Urgent Earthquake Detection and Alarm System)
- 6 Dec — Completed CTC between Nagoya and Nakatsugawa on Chuo main line

1993

- 18 Mar — Extended *Nozomi* service to San'yo Shinkansen
- 1 Aug — Introduced *Kiha* 75 DMU (Diesel Multiple Unit) trains for *Mie* rapid services
- 16 Dec — Opened Asahi Tunnel on Yamanashi Maglev Test Line

1994

- 25 Aug — Held groundbreaking ceremony for JR Central Towers
- 1 Oct — Commemorated 30th anniversary of Tokaido Shinkansen
- 25 Oct — Commemorated 60th anniversary of full operation of Takayama main line
- 1 Dec — Commemorated 60th anniversary of Gotemba Line

1995

- 27 Jan — Started testing 300X Test Train
- 16 Mar — Opened Otobashi Station on Tokaido Line
- 29 Apr — Introduced Series 383 trains for *Shinano* limited express
- 1 Oct — Debuted *Fujikawa* limited express on Minobu Line
- 10 Oct — Completed CTC between Shinjohara and Maibara on Tokaido main line

1996

- 16 Mar — Debuted *Tokai* and *Inaji* limited expresses
- 18 Mar — Held groundbreaking ceremony for Stand-by Operation Control Center for Tokaido and San'yo shinkansen
- 1 Jun — Started Let's Ride Wide-view campaign
- 1 Jul — Founded Yamanashi Maglev Test Center
- 26 Jul — Recorded 300X test train speed of 443.0 km/h
- 1 Dec — Debuted *Wide-view Shinano* limited express

1997

- 2 Mar — Opened redeveloped Gifu Station
- 9 Mar — Opened new *Kalmia* Toyohashi Station building
- 3 Apr — Started testing trains on Yamanashi Maglev Test Line
- 26 May — Held groundbreaking ceremony for new Shinagawa Station on Tokaido Shinkansen
- 11 Jun — Introduced first automatic shinkansen ticket gates at Shizuoka Station
Opened Associa Toyohashi Hotel
- 20 Aug — Commemorated 60th anniversary of Iida Line
- 8 Oct — Listed JR Central shares on Nagoya, Tokyo, Osaka, and Kyoto stock exchanges
- 12 Dec — Recorded manned, world-record, train speed of 531 km/h on Yamanashi Maglev Test Line
- 24 Dec — Recorded unmanned, world-record, train speed of 550 km/h on Yamanashi Maglev Test Line

1998

- 30 Mar — Held 70th anniversary of full operation of Minobu Line
- 11 Jun — Started passing testing of trains on Yamanashi Maglev Test Line
- 30 Oct — Opened Higashi-Shizuoka Station on Tokaido Line
- 27 Nov — Opened Ontake Snow Resort
- 2 Dec — Held roof-raising ceremony for JR Central Towers

1999

- 26 Feb — Completed Stand-by Operation Control Center for Tokaido and San'yo shinkansen
- 13 Mar — Introduced Series 700 trains for *Nozomi* services
- 14 Apr — Recorded manned, world-record, train speed of 552 km/h on Yamanashi Maglev Test Line
- 6 May — Introduced Series 313 trains on Chuo main line
- 18 Sep — Retired Series 0 trains on Tokaido Shinkansen
- 4 Dec — Debuted Central Liner service
- 20 Dec — Completed construction of JR Central Towers

2000

- 15 Mar — Opened JR Nagoya Takashimaya
- 17 May — Opened Nagoya Marriott Associa Hotel
Opened all areas of JR Central Towers
- 13 Jul — Received Milestone Prize and Landmark Prize for Tokaido Shinkansen

2001

- 1 Jan — Started Visit Japan and Tokaido Walking campaigns
- 3 Mar — Opened Haruta Station on Kansai Line
- 22 Apr — Opened Aino Station on Tokaido main line
- 3 Sep — Started Express Reservation service
- 1 Dec — Amended JR Law

2002

- 20 Feb — Completed tests totalling more than 200,000 km on Yamanashi Maglev Test Line
- 1 Jul — Opened General Technical Center in Komaki City, Aichi Prefecture
- 17 Sep — Opened Nagaizumi-Nameri Station on Gotemba Line

2003

- 25 Feb — Completed construction of Marunouchi Central Building
- 1 Apr — Started Express Research business
- 30 May — Published plans for JR Tokaido Shin-Yokohama Station Building (provisional name)
- 18 Jun — Licensed first female shinkansen train driver
- 27 Jun — Published description of next-generation shinkansen train (N700)
- 16 Sep — Retired Series 100 trains on Tokaido Shinkansen
- 20 Sep — Started Ambitious Japan! campaign
- 1 Oct — Opened new Shinagawa Station on Tokaido Shinkansen and upgraded all shinkansen trains to run at 270 km/h
Started 50+ Travel Club
- 2 Dec — Recorded manned, world-record train speed of 581 km/h on Yamanashi Maglev Test Line

2004

- 16 Feb — Held groundbreaking ceremony for JR Central Maglev Pavilion at Aichi Expo
- 5 Apr — Completed construction of JR Tokai Shinagawa Building
- 1 Oct — Commemorated 40th anniversary of Tokaido Shinkansen
- 11 Oct — Completed work linking Chuo main line with Aichi Loop Line
- 25 Oct — Commemorated 70th anniversary of full operation of Takayama main line
- 28 Oct — Completed tests totalling more than 400,000 km on Yamanashi Maglev Test Line
- 1 Dec — Commemorated 70th anniversary of Gotemba Line

2005

- 1 Feb — Started selling Special Early Express tickets
- 14 Mar — Completed construction of JR Central Maglev Pavilion and held opening ceremony
- 1 Apr — Opened First Avenue Tokyo Station
- 30 May — Started verification tests for Express Reservation IC Service
- 8 Jul — Held groundbreaking ceremony for JR Tokaido Shin-Yokohama Station Building (provisional name)
- 26 Jul — Started full privatization with sale of 600,000 shares by Japan Railway Construction, Transport and Technology Agency
- 30 Aug — Started TERRA (Tokaido shinkansen Earthquake Rapid Alarm System) operation on Tokaido Shinkansen
- 3 Nov — Opened Central Square Shizuoka
- 30 Nov — Started Dokonani website for affiliated businesses
- 10 Dec — Expanded Express Reservation to Shin-Kobe

2006

- 18 Mar — Introduced new Automatic Train Control on Tokaido Shinkansen
- 5 Apr — Completed full privatization by buying back stock from JRJT
- 19 Jun — Started Dokonani Tokusengai website for online shopping
- 18 Jul — Opened Nagoya Central Hospital
- 22 Jul — Expanded Express Reservation to entire San'yo Shinkansen
- 25 Nov — Started TOICA IC card ticket service

*Compiled by Kotsu Shimbusha, based on company directory and *Kotsu Shimbus*