

# Shinkansen

## Japanese High-speed rail



*Ministry of Land, Infrastructure, Transport and Tourism*

# Shinkansen

## Japanese

### High-speed rail

The Shinkansen is a high-speed rail that was pioneered in Japan.

It has made a tremendous contribution to the development of Japan by connecting people, products, work and life.

This is for people in the world involved with the planning and introduction of high-speed rail systems, with the purpose of describing and explaining the features and advantages of the Shinkansen system.

It's our hope that it can serve as helpful reference material to help in the creation of their own systems.

Series E5



Series N700



Series 700  
Rail Star



Series 800



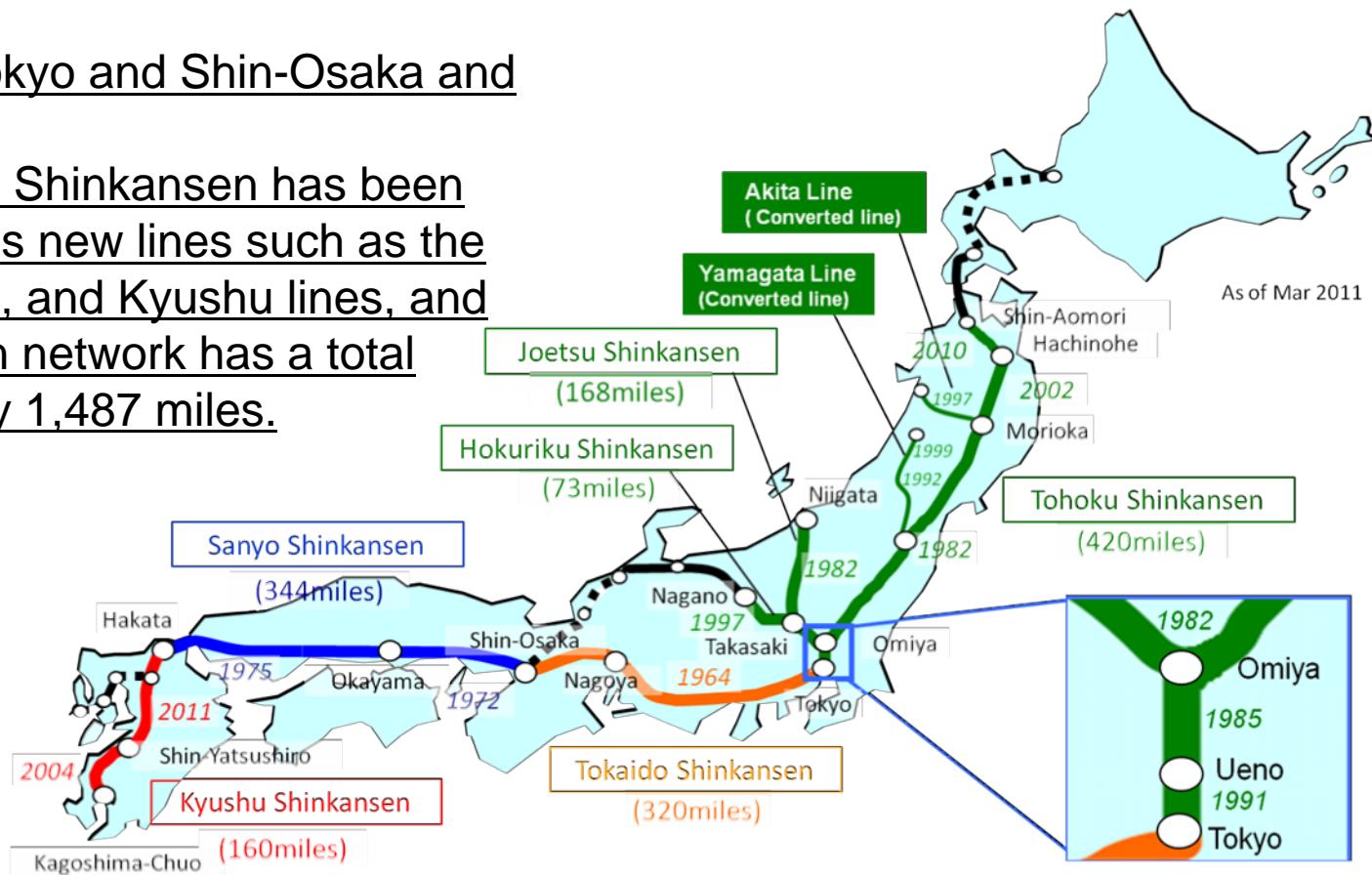
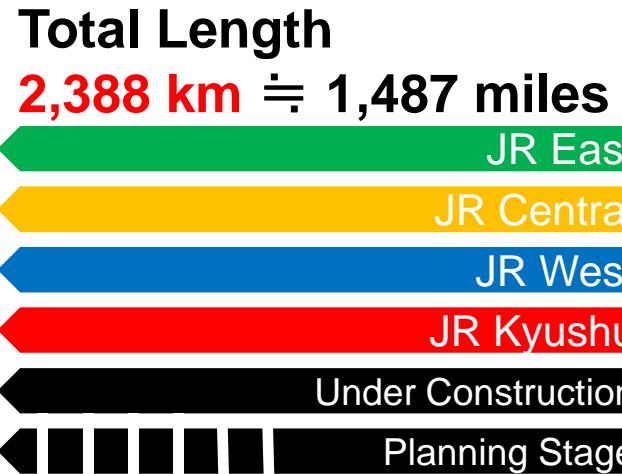
# Shinkansen

## High-speed rail

### Network

The oldest Shinkansen line is the Tokaido Shinkansen, which runs between Tokyo and Shin-Osaka and opened in 1964.

Since then the Tokaido Shinkansen has been extended to encompass new lines such as the Sanyo, Tohoku, Joetsu, and Kyushu lines, and the current Shinkansen network has a total length of approximately 1,487 miles.



# Absolute Reliability

## BOTH SAFE AND STABLE

**Both high safety and stability come from the world-class integrated technologies of the Shinkansen**

Safety and stability are maintained by comprehensive technologies that encompass the performance of the carriages, control devices, and operating management systems.

The Shinkansen achieved both high safety and stability levels with its comprehensive technologies, which include vehicles, signals, and operating systems. They work together to create world-class safety.

**ZERO 1964►Present Time**

**Safety**

**A safety record of no passenger fatalities in 46 years of operations**

There have been no passenger fatalities since the Shinkansen first commenced operation in 1964.

(Reference data: Total number of passengers from 1964 to 2009: Approx .9.2billion)

**within 1 minute**

**The average delay time per trip is within one minute**

Approximately 362,000 runs are made each year. The average delay time per trip is within one minute, even including weather-related delays.

# Economic Development

The economic impact is

**\$19 BILLION**

or more if invigorated vehicle manufacturing, real-estate, construction, restaurant and business sales are added.

The movement of many people brings many economic benefits

The Shinkansen carries as many as 315 million passengers and its operating revenue is 19 billion dollars a year. (2008 fiscal year: \$1=100) This is a large economic benefit on its own, but the economic impact is enormous when the additional revenues from vehicle manufacturing and from real-estate and restaurant business around the stations are included.

**Urban development**

The opening of the Shinkansen line promotes development of the areas around its stations, which is expected to help entirely new cities.

The Shinkansen is a world leader in train frequency and capacity.

It offers a broad range of benefits, not only to the users but also to local regions and economies.

**Ease highway congestion with reduced traffic volumes**

The Shinkansen is also an effective way to ease highway traffic congestion, by offering motorists an attractive high-speed alternative and enabling smooth connections to buses and existing railways networks.

**Rising employment**

**Creating jobs by invigorating high-speed rail businesses**

The startup of high speed rail construction would require a large number of employees to build facilities and manufacture train cars in the short term. Railway maintenance, operations, management and related business would generate a lot of jobs in the medium to long term as well. It will also deliver a boost to the economies of surrounding regions.

# Social Contribution 1

The environmental footprint of the Shinkansen is less than that of any other transportation system.

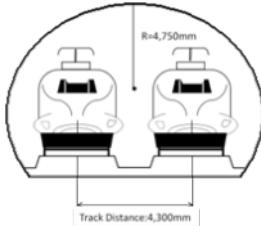
## CO<sub>2</sub> emission comparison



### Excellent environmental performance

Data shows that the Shinkansen emits much less CO<sub>2</sub> and consumes much less energy compared with automobiles and airplanes.

64 m<sup>2</sup>



Tunnel Cross Section

### Small infrastructure

The Shinkansen has smaller tunnel cross section areas for reasons including the airtightness of its car body.

### Wide and Lightweight Car Body

Shinkansen	Series E5	Series N700
	 prototype	
Maximum Speed (km/h)	320★	300
Width(mm)	3,350	3,360
Seat pitch(mm)	1,040	1,040
Trainset length(m)	253	405
Trainset(cars)	10	16
Seats(num.)	731	1,323
Trainset Weight(ton)★★	454	635
Trainset Weight /Seat(ton/seat)	0.62	0.48

★ Scheduled in FY2012

★★ Unloaded, approximate date (Series N700)

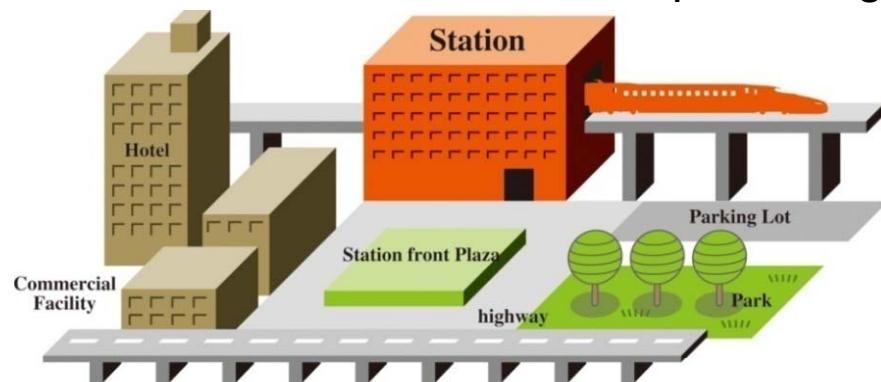
# Social Contribution 2

The Shinkansen contributes to the development of local communities while protecting public safety and the global environment.

## Access through Feeder Networks

Access to urban railways and subways leads to convenience in the use of the Shinkansen.

Image : Shinkansen lines are linked directly to public transportation networks.



## Reduce travel time

The advantages of shorter traveling times compared with other systems

Safe and fast itself, the Shinkansen is also closely linked to existing railways to further reduce travel times. There is no need to consider the travel time between an airport to the destination or deal with traffic jams. Please refer to the new United States map.

### Travel times significantly shorted

Hokuriku Shinkansen (Takasaki-Nagano)

**Opening in October, 1997**

Tokyo ► Nagano

Before Opening

2h. 56min.

After Opening

1h. 23min.

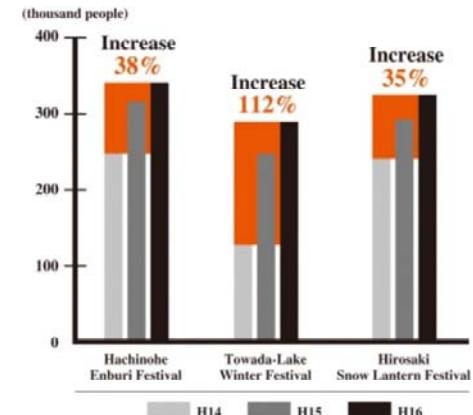
1h. 33min. shorten

Reinvigorating local communities by boosting business and tourisms.

The Shinkansen not only improves business value by enhancing inter regional exchanges; it also expands demand for tourism.

### Increased number of tourists

Tohoku Shinkansen  
(Morioka-Hachinohe)



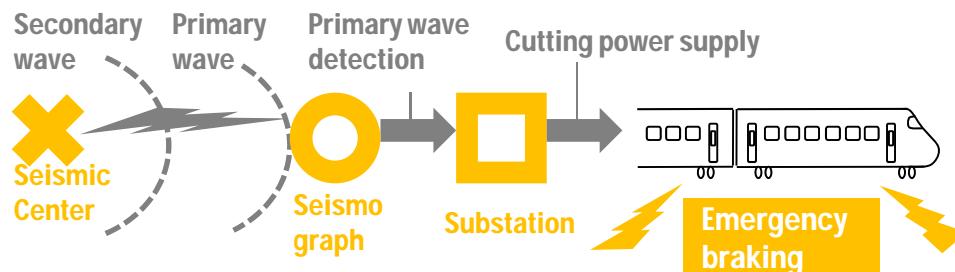
Increase in tourists visiting sightseeing events (festivals)

# Advanced Technologies

The Shinkansen boasts an impressive array of functions to meet diverse needs.

## Early earthquake detection system

The system detects earthquakes at an early stage and immediately halts the trains. This technology was developed for one of the most earthquake-prone countries in the world.



## Snow removing technology

Abundant data and robust technology allow for stable services, even in snowy regions.

## Noise control

The Shinkansen meets Japanese noise pollution standards -among the toughest in the world- with its pantograph, engineered carriage shape and light-weight carriages.



## Comfortable journey

The wide carriage and spacious passenger seats ensure a comfortable journey. Passengers also have internet access.

## Highly efficient mass transport system

The double-deck carriages offer the world's greatest transportation capabilities.



## Connectivity with existing railways

The Shinkansen lines are linked directly to public transportation networks, offering even greater convenience and comfort.

