

**Session 1: Mr. Noriyoshi Yamagami**

**Presentation entitled:**  
**High Speed Rail: Experiences from Japan**

**Biographic Data of Speaker**



Noriyoshi Yamagami  
Counselor, Director, Office of Global Strategy for Railway  
Development, Railway Bureau, MLIT  
JAPAN

---

**Education:**

- 1992 MA in Politics, Stanford University, United States
- 1987 BA in Law, University of Tokyo, Japan

**Professional Background:**

- 2009-present Counsellor, Director, Office of Global Strategy for Railway Development, Railway Bureau, MLIT
- 2007-2010 Director, Accidents Compensation Division, Road Transport Bureau, MLIT
- 2004-2007 Counsellor, Embassy of Japan in United Kingdom
- 2003-2004 Director for General Affairs, Ports and Harbours Bureau, MLIT
- 2001-2003 Group Leader for General Affairs Division, Central Japan International Airport Co., Ltd.
- 1987 Joined Ministry of Land, Infrastructure, Transport and Tourism (MLIT)

## **HIGH SPEED RAIL: EXPERIENCES FROM JAPAN**

On this Session, Mr. Yamagami will demonstrate main features of Shinkansen (High-Speed Rail in Japan) including excellent environmental performance, as well as benefits to the society.

# Session 1

## High-Speed Rail : Experiences from Japan (1)

---

26 August 2011  
Ministry of Land, Infrastructure, Transportation and Tourism,  
Japan



*Ministry of Land, Infrastructure, Transport and Tourism*

---

## I . Rail Network in Japan

---



*Ministry of Land, Infrastructure, Transport and Tourism*

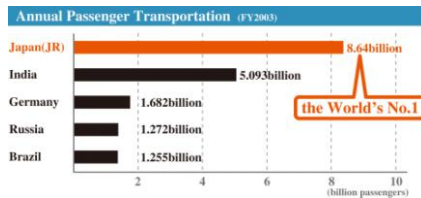
---

Overview of Japan's Rail Network

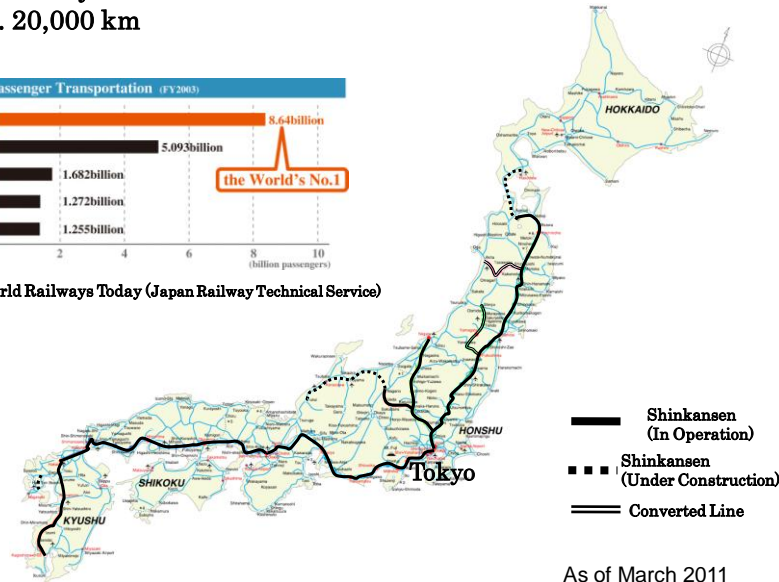


Ministry of Land, Infrastructure, Transport and Tourism

Japan Railway (JR) Network  
Approx. 20,000 km



Source: World Railways Today (Japan Railway Technical Service)



As of March 2011

Overview of Japan's Rail Network



Ministry of Land, Infrastructure, Transport and Tourism

Tokyo Metropolitan Area; Within 50km Radius of Central Tokyo

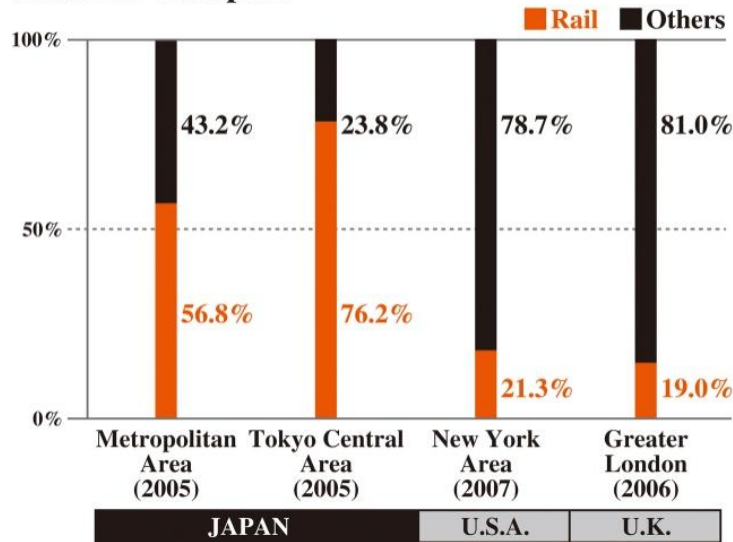


- Shinkansen
- JR Lines
- Other Private Railway Lines
- Shinkansen Station

Overview of Japan's Rail Network

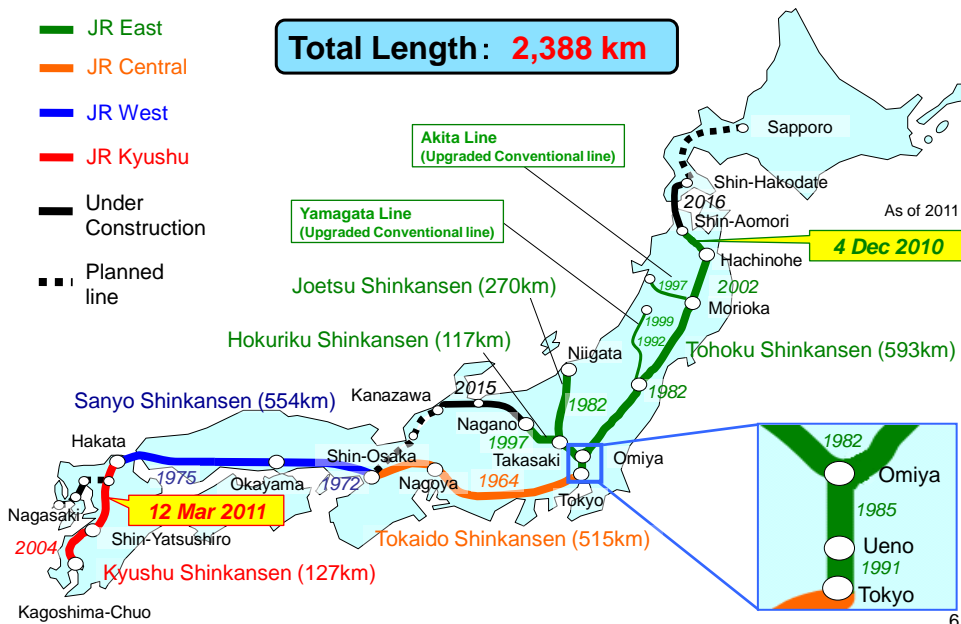


Share of Transport



5

Japan's Current HSR Network



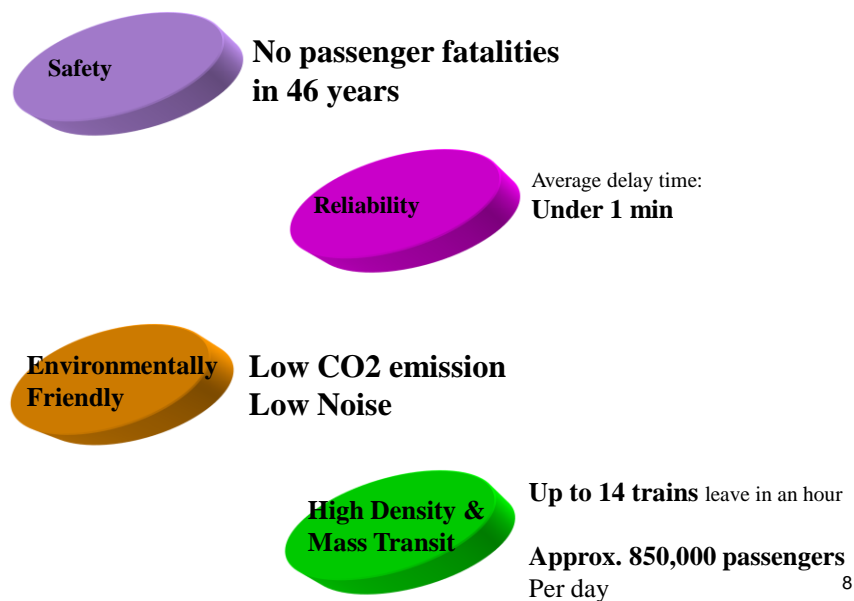
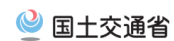
6

## II . Main Features of “Shinkansen”



Ministry of Land, Infrastructure, Transport and Tourism

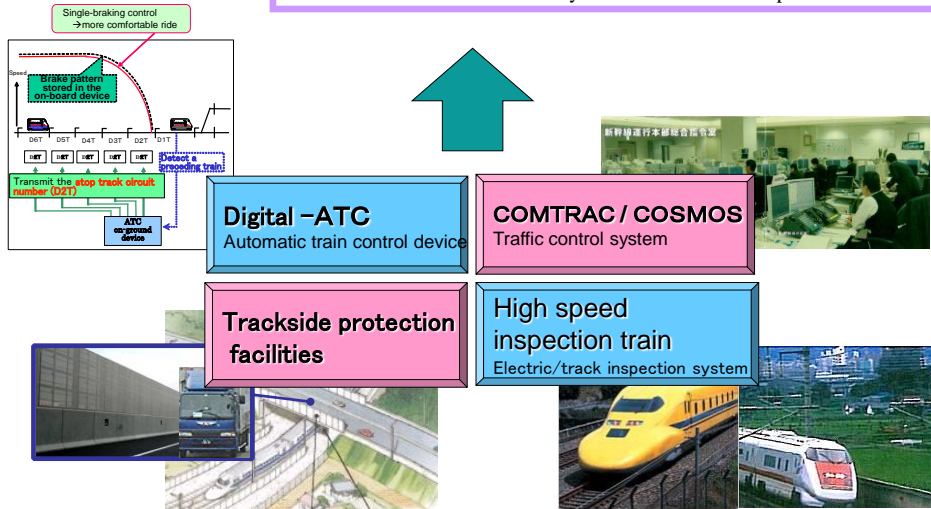
### Main Features of Shinkansen



Safety

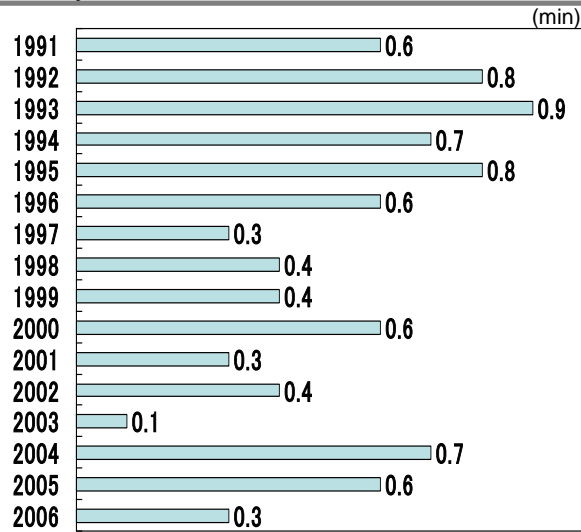
Fatal accidents to date: **ZERO**

No fatalities in the 46 years since the start of operations in 1964



Reliability

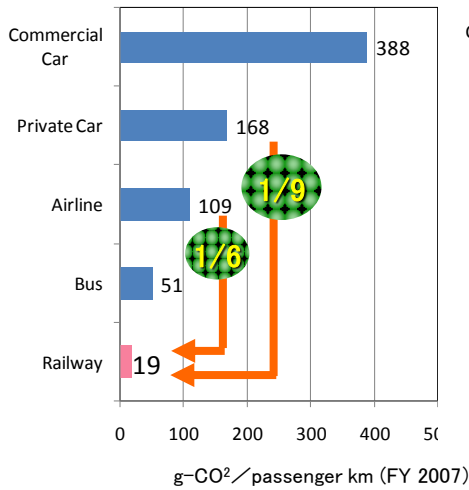
■ Average delay time: **Under 1 min**



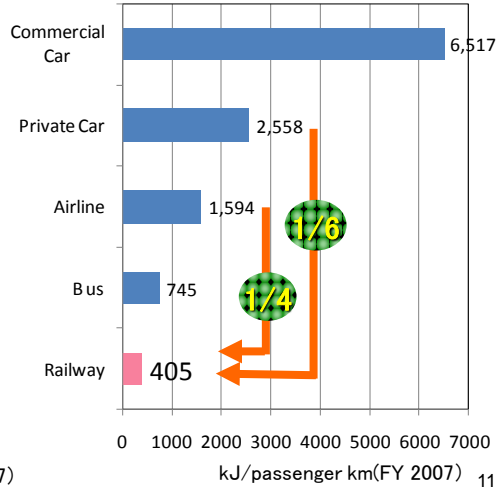
Data: Tokaido Shinkansen

Environmentally Friendly

Lower CO<sub>2</sub> emissions



Less Energy Consumption



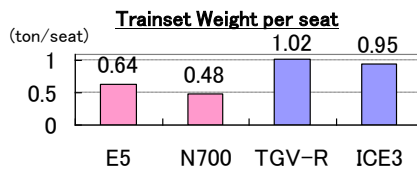
Environmentally Friendly

Lightweight

Low CO<sub>2</sub> emissions & energy consumption

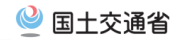
	Shinkansen (Series E5)	Shinkansen (Series N700)	TGV (TGV-R)*	ICE (ICE3)*
Trainset (cars)	10	16	20	16
Seats (num.)	713	1,323	750	858
Trainset Weight (ton)**	454	635	766	818
Trainset Weight/Seat (ton/seat)	0.64	0.48	1.02	0.95

\*Coupling of trainsets  
\*\*Unloaded, approximate data(Series N700)







**Environmentally Friendly**



### Current Noise-Collecting System



Pantograph Cover




Low-noise type Pantograph

### Noise from train bottom

- Lightening of car bodies  
(Axle load)


<b>Tokaido Shinkansen N700</b>	<b>11 ton</b>
<small>(ref.) European rapid trains</small>	16-17 ton

- Smoothing surfaces of rails and wheels




Rail grinding

### Aerodynamic Sound from upper part of train




Stream-lined front



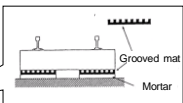
Smoothing of car bodies

### Noise from structures

- Slab Track (Vibration Isolation)




Slab Track




Grooved mat  
Mortar

### Noise Barrier

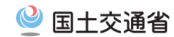


Interference-type Soundproof Device



Inverted-L type Noise Barrier

**High Density & Mass Transit**



### High Density... Up to 14 trains per hour



### Wider body... More seats



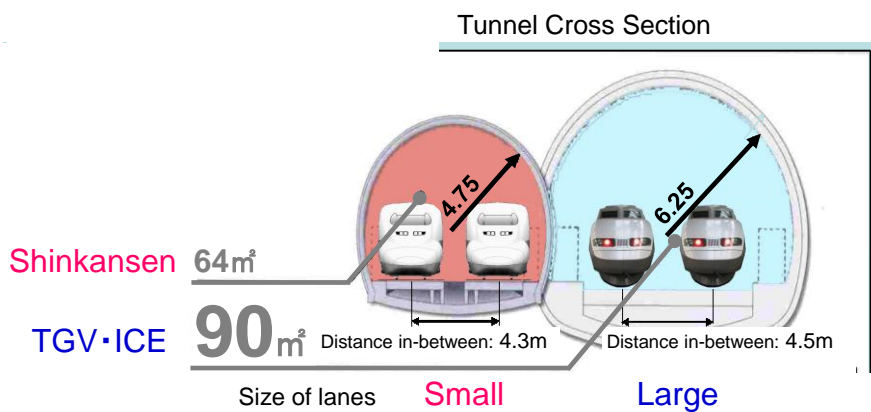
	Seat pitch (feet)	Passage width (feet)
<b>Shinkansen</b>	<b>3.2 - 3.4</b>	<b>1.9 - 2.0</b>
<b>TGV-R</b>	<b>2.9</b>	<b>1.5</b>
<b>ICE3</b>	<b>3.0</b>	<b>1.8</b>

### Main Features of Shinkansen



Ministry of Land, Infrastructure, Transport and Tourism

#### ○ Small infrastructure

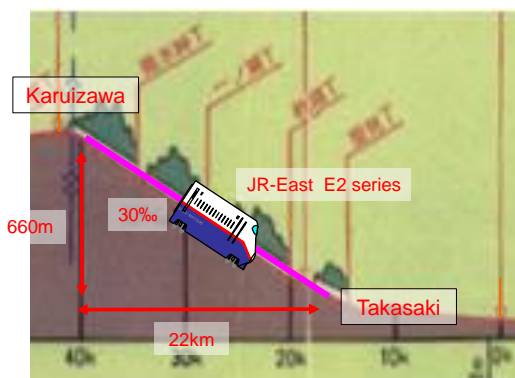


### Main Features of Shinkansen



Ministry of Land, Infrastructure, Transport and Tourism

#### ○ Cross-section of Nagano Shinkansen's long steep-slope segment



### Main Features of Shinkansen



Ministry of Land, Infrastructure, Transport and Tourism

○ What are the benefits of these strong points?

<b>High Energy Efficiency &amp; Less CO<sub>2</sub> Emission</b> Lightweight	<b>Low Noise</b> World's strictest trackside-noise regulation applied
<b>Passenger Comfort</b> Wider car body & longer seat pitch	<b>Big Capacity</b> More passengers per train
<b>Low Construction Cost</b> Smaller tunnel cross-section & lane sizes	<b>Low Maintenance Cost</b> Lightweight

### Established Record of Outstanding Safety & Reliability Over 46 Years

■ Passenger casualties to date: **ZERO**

■ Average delay time: less than **1 min**

## III. Benefits of High-Speed Rail

---

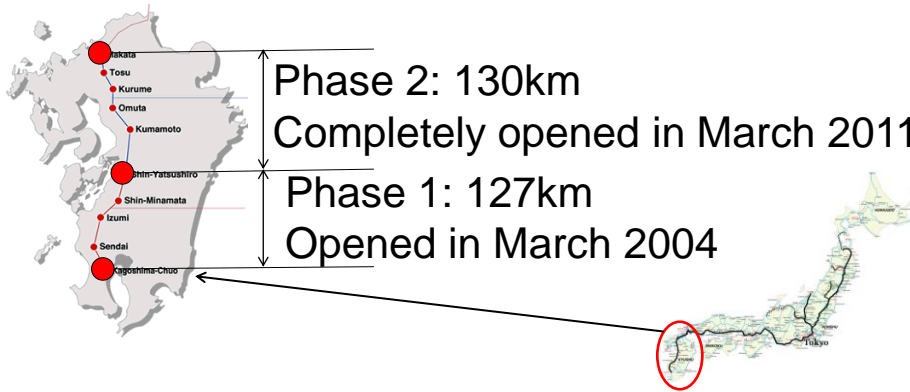


Ministry of Land, Infrastructure, Transport and Tourism

Case of Kyushu Shinkansen



# Kyushu Shinkansen: 257km

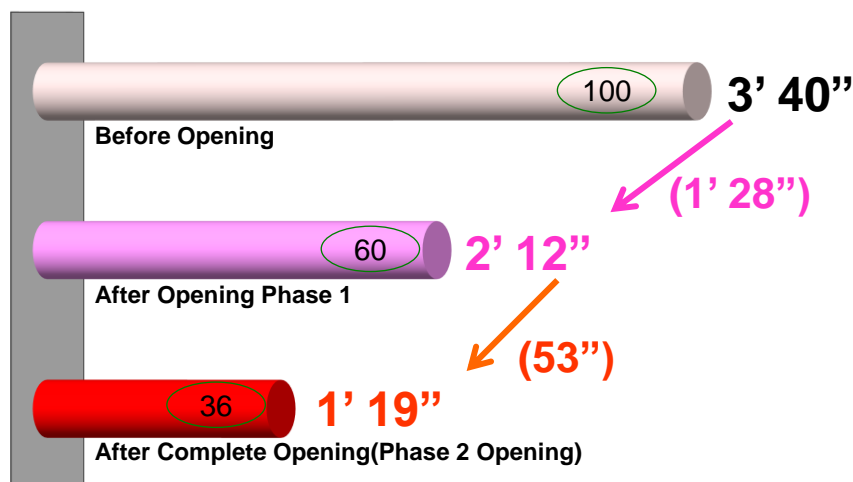


Kyushu's population and GDP are about the same as the Netherlands'.

Case of Kyushu Shinkansen



## ■ Big Time Savings

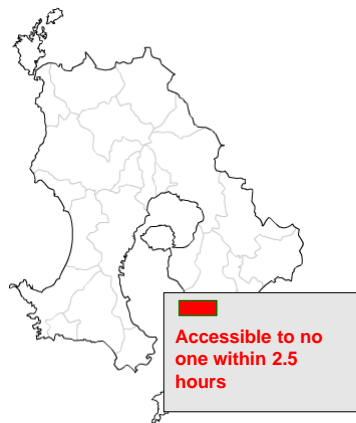


### Case of Kyushu Shinkansen

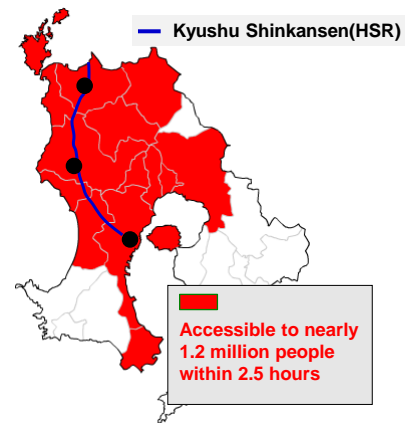


## Areas accessible from central city within 2.5 hours

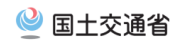
Before opening



After complete opening

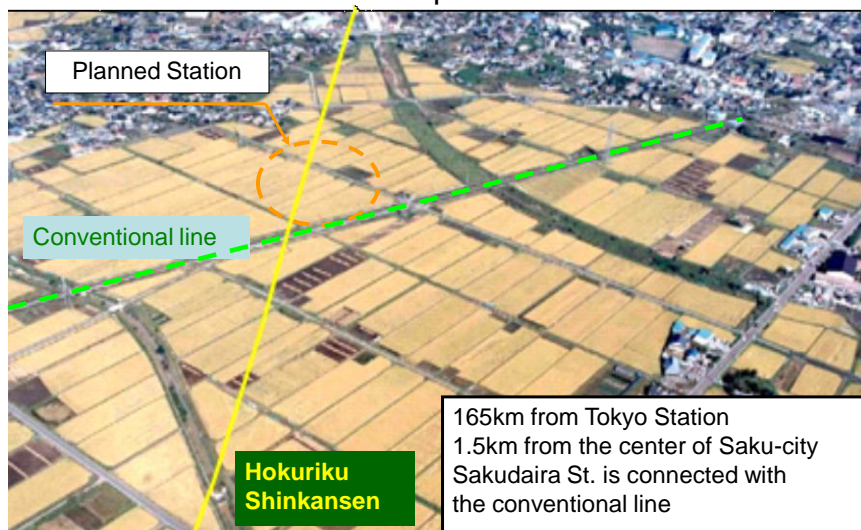


### Regional Development

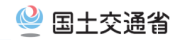


#### Area around Sakudaira St.

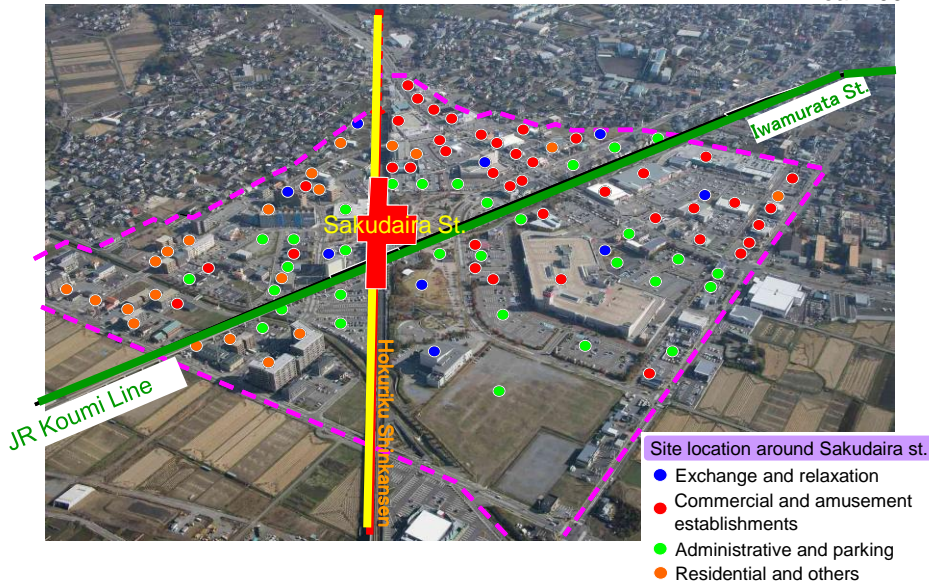
Before 0.6km<sup>2</sup> development around the station



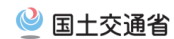
Regional Development



Area around **Sakudaira St.** (10 years after opening)  
= Year 2007

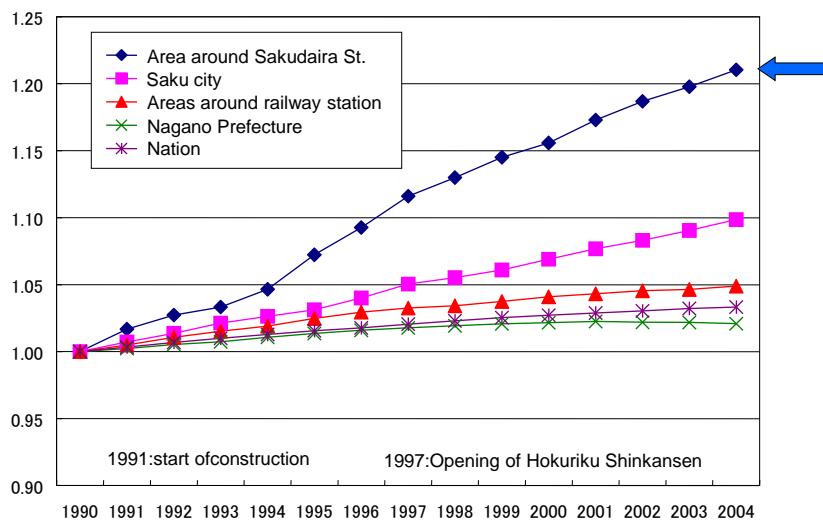


Regional Development



Increase of the population in the area around Sakudaira St.

(1990=1.00)



New Job Creation & Development of Regional Economies



Railway construction



Rail track maintenance



Rolling-stock manufacturing



Shopping outlets inside station



Re-development around station(1)



Re-development around station(2)



Thank you!