



Beyond the Bullet Train: Lessons from Japan's Shinkansen

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SJSU SAN JOSÉ STATE
UNIVERSITY

MTI // MINETA
TRANSPORTATION
INSTITUTE



Today's Journey

- Eric will share first impressions on Japan and introduce the topic
- Bryan will discuss Japan's systematic approach to speeding up the trains
- Mark will focus on the role of Shinkansen in the transportation network, TOD, and tourism!



**Japan is the world's
pioneer in high-
speed rail,
beginning service in
1964**



7: Sapporo [END]

6: Niseko

3: Nagoya

2: Kyoto

5: Tokyo

4: Hakone

1: Osaka [START]

Approximately
1,200 miles of
travel over 14 days
Mostly by rail
2/3 by Shinkansen



Osaka



Kyoto



Nagoya



Hakone



Tokyo



Morioka



Niseko



Sapporo







歌舞伎町一番街



Basil Morin

Kabukicho [Tokyo]



Shibuya Scramble [Tokyo]



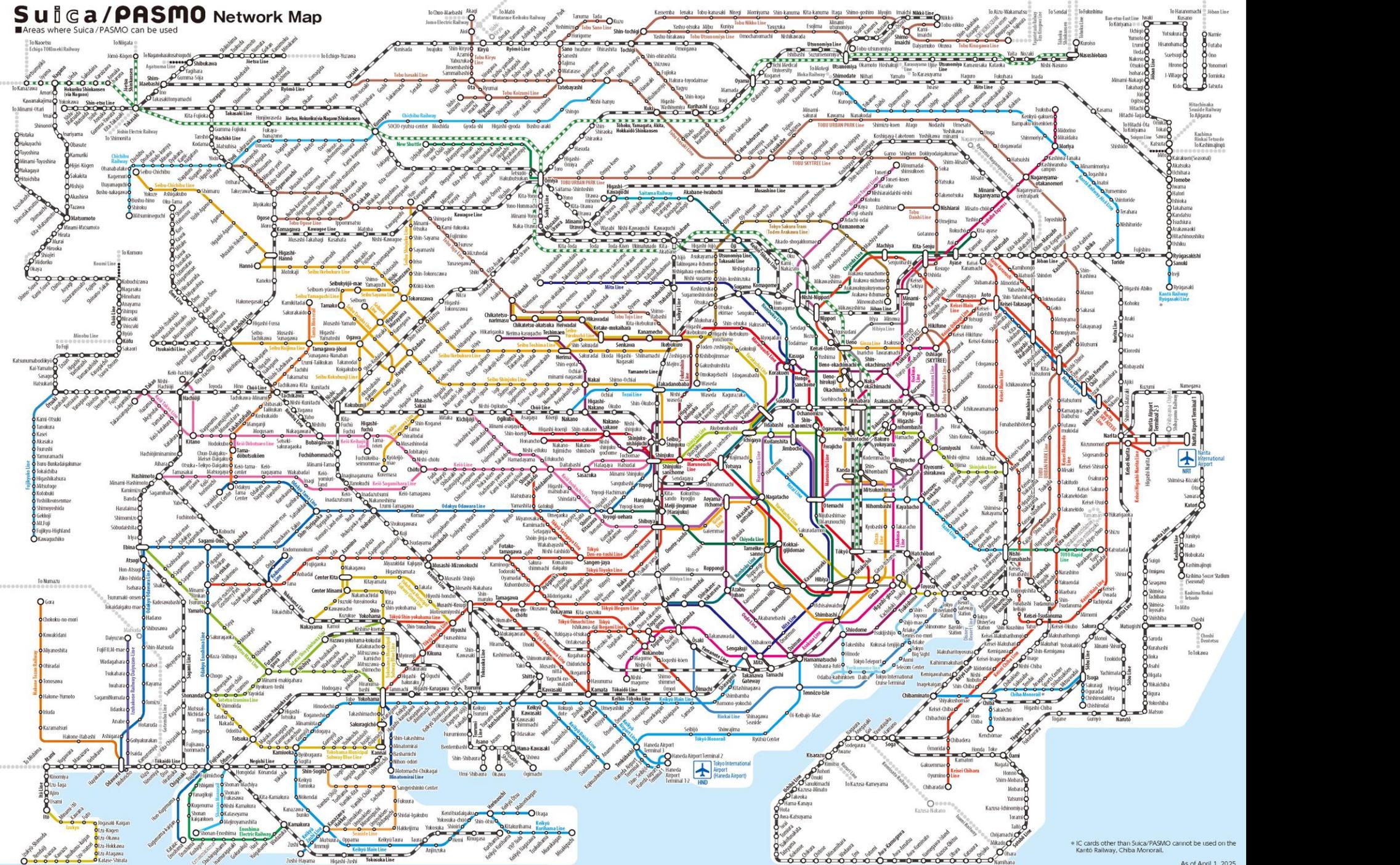
Dotonbori [Osaka]



Don Quijote [Osaka]

Suica/PASMO Network Map

■ Areas where Suica/PASMO can be used



* IC cards other than Suica/PASMO cannot be used on the Karbi Railway, Chiba Monorail.





Nishinjuku [Tokyo]



Osaka Castle Park [Osaka]



Kiyomizu-Dera Temple [Kyoto]



Yoyogi Park [Tokyo]



Miyashita Park [Tokyo]

1  **Shinjuku Station** 
Tokyo, Japan 3.6 millions per day 

2  **Shibuya Station** 
Tokyo, Japan 3 millions per day 

3  **Ikebukuro Station** 
Tokyo, Japan 2.5 millions per day 

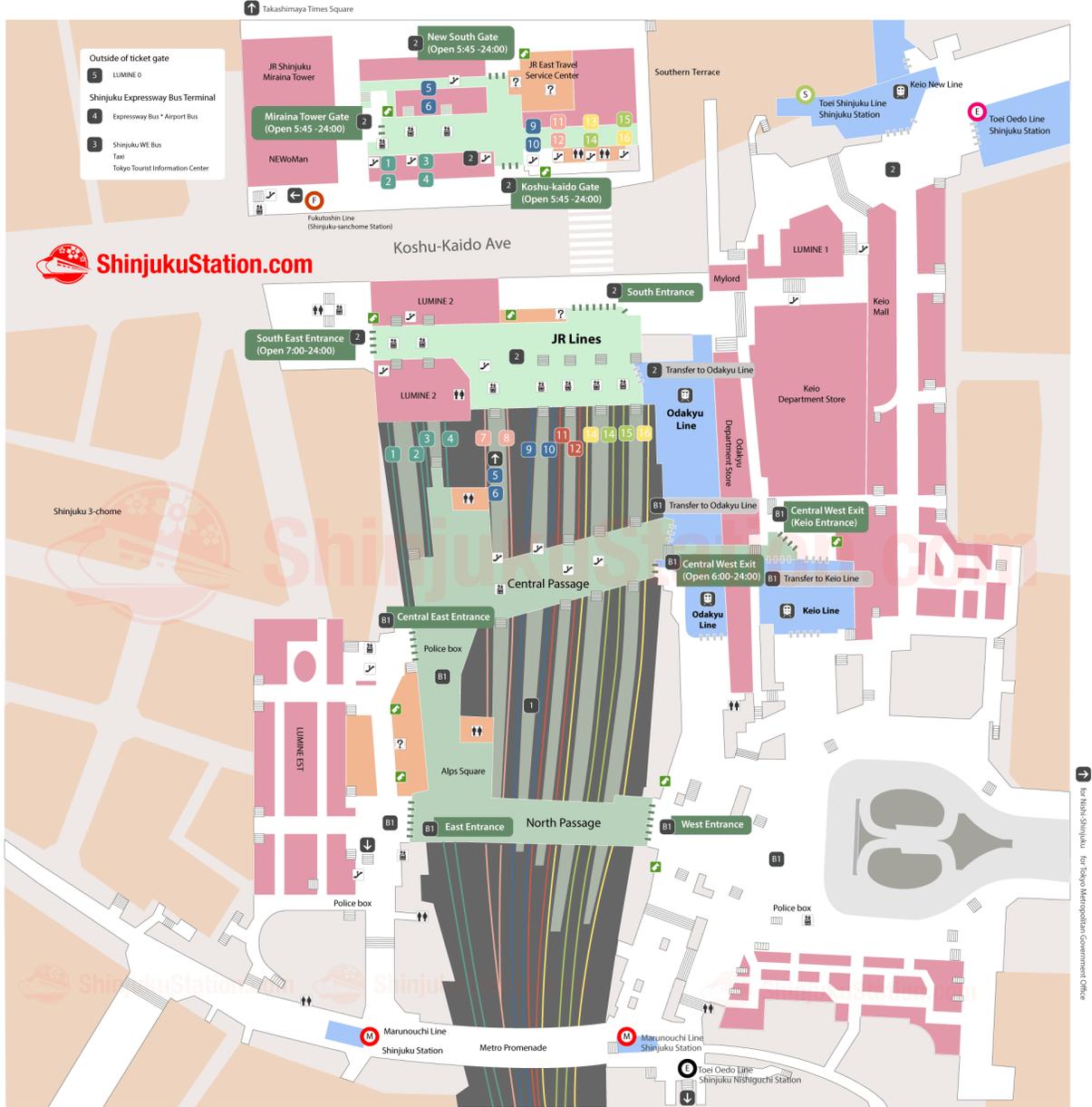
4  **Umeda Station** 
Osaka, Japan 2.3 millions per day 

5  **Yokohama Station** 
Kanagawa, Japan 2.1 millions per day 

- | | |
|--|--|
| 6  Kita-Senju Station | 15  Kyoto Station |
| 7  Nagoya Station | 16  Sannomiya Station |
| 8  Tokyo Station | 17  Omiya Station |
| 9  Shinagawa Station | 18  Yurakucho-Hibiya Station |
| 10  Takadanobaba Station | 19  Nishi-Funabashi Station |
| 11  Namba Station | 20  Meguro Station |
| 12  Shinbashi Station | 21  Daimon-Hamamatsucho Station |
| 13  Tennoji Station | 22  Ueno Station |
| 14  Akihabara Station | 23  Oshiage Station |

The top 23 busiest train stations in the world are in Japan

24  **Paris Nord Station** 
Paris, France 0.67 millions per day 





LUMINE 2



住友不動産

JR 新宿駅 南改札 South Gate 新宿駅 南改札

JY IC JB JA JS



Shinjuku [Tokyo]



Shibuya [Tokyo]



Namba Station [Osaka]



Shin Imamiya Station [Osaka]





← HOTEL GRANVIA KYOTO
HOTEL GRANVIA KYOTO

→ 駅ビルエレベーター(伊勢丹内) 2F~11F
7F 伊勢丹
8F 伊勢丹客席
10F 伊勢丹客席
11F レストラン街

HOTEL GRANVIA KYOTO
ホテルグランヴィア京都

← 案内センター
案内センター

→ 京都総合観光案内所
Kyoto Sightseeing Center

新幹線
Shinkansen
京都 新幹線

指定席
指定席

山陰本線
山陰本線

山陰快速
山陰快速

Kyoto Station [Kyoto]



Tokyo Station [Tokyo]



JR東海

JR全線きっぷうりば

Shinkansen and JR Line Tickets



IC Cards

- IC card readers worked flawlessly throughout the trip
- Much more reliable than North American smart cards
- Can use to purchase all kinds of things beyond transit



Luggage Shipping from Osaka Airport to Niseko



- Used luggage delivery service to send ski gear to Niseko Osaka Airport (KIX)
- Cost: 7,700 Yen (~\$50) for ski bag, boot bag, and ski clothing

How does the Tokaido Shinkansen move **more people, more reliably, and more efficiently**, than almost any other high-speed railway on Earth?

At its busiest, one train departs from Tokyo and Osaka **every two minutes on average**, resulting in 483 trips between the two cities in a single day.

On a normal day, there are **only around 254 trains per day**.
No sweat.

In 2024, the average Tokaido Shinkansen **delay was just 96 seconds***.

*Yes, that **includes** delays from natural disasters.

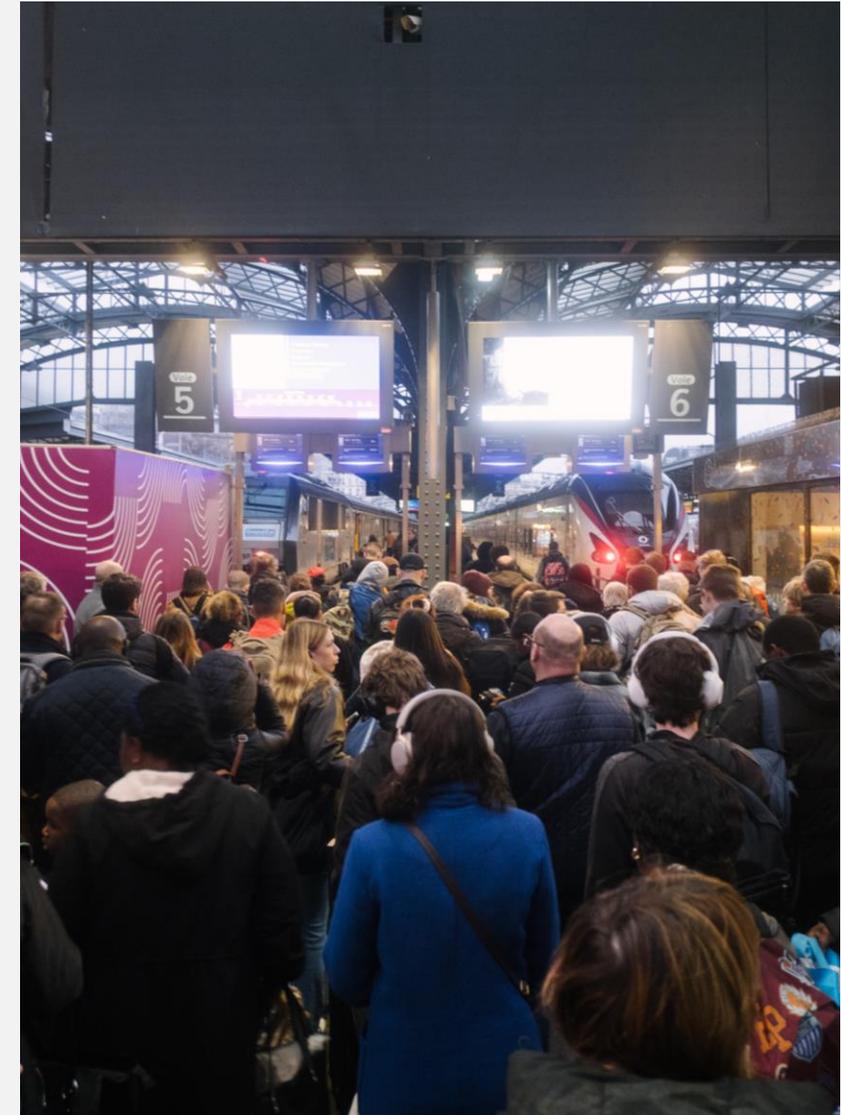
So how does it happen?

No magic involved! Just a continuous focus on **speeding up the slow parts of the total journey.**

Speed up entry (and exit) into the system.



Parallel entry through numerous fare gates and gate lines away from chokepoints.

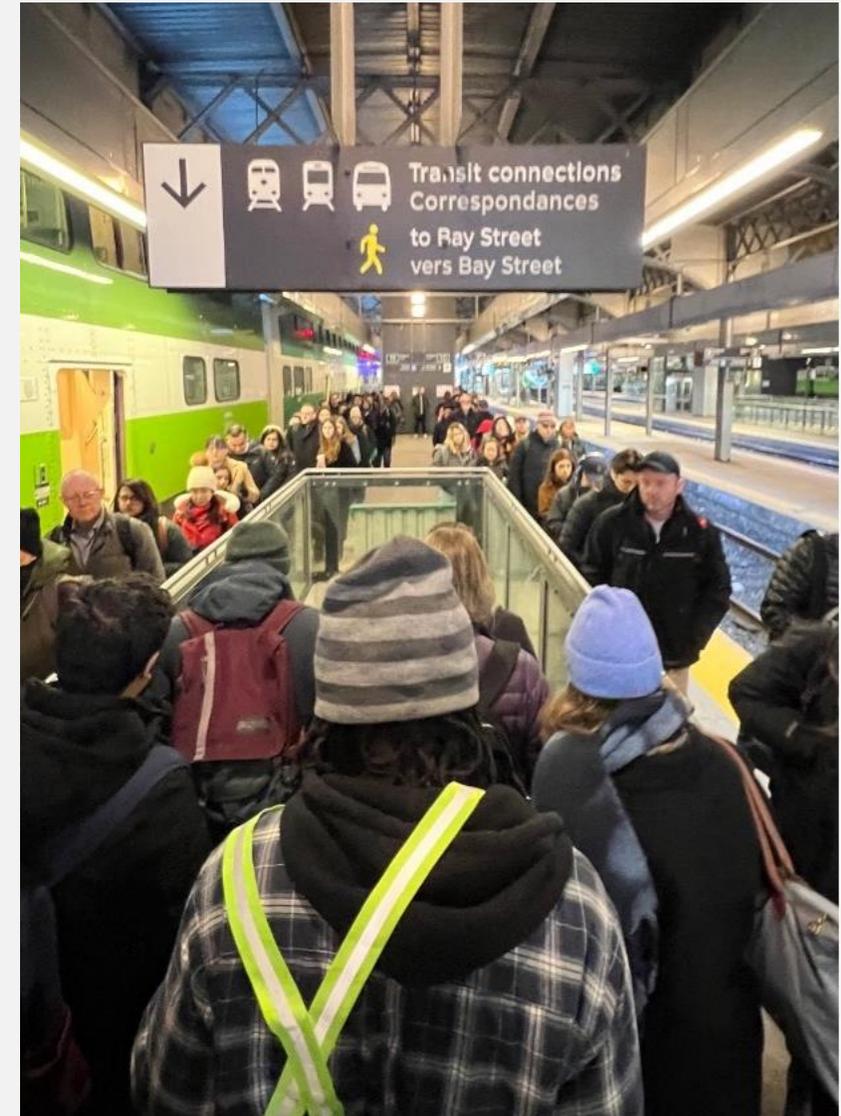


Serialized entry at chokepoints.

Speed up access to and from the platforms.



Wide platforms with wide stairs and multiple elevators reduce train dwell time.



Narrow stairs lengthen occupation time.

Speed up access to and from the platforms.



Wide platforms with wide stairs and multiple elevators reduce train dwell time.

Speed up boarding and alighting to reduce dwell times.



Single level train makes it much easier to board and alight.

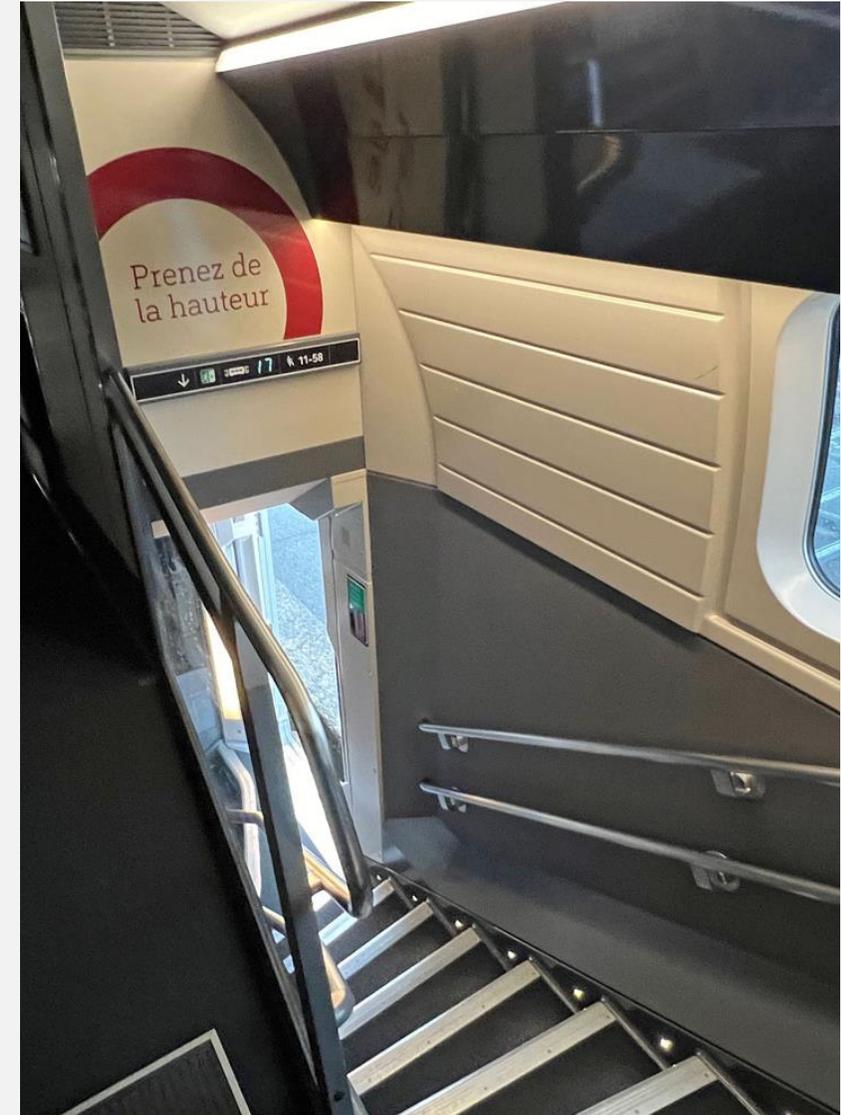


Is double decker better capacity?

Speed up boarding and alighting to reduce dwell times.

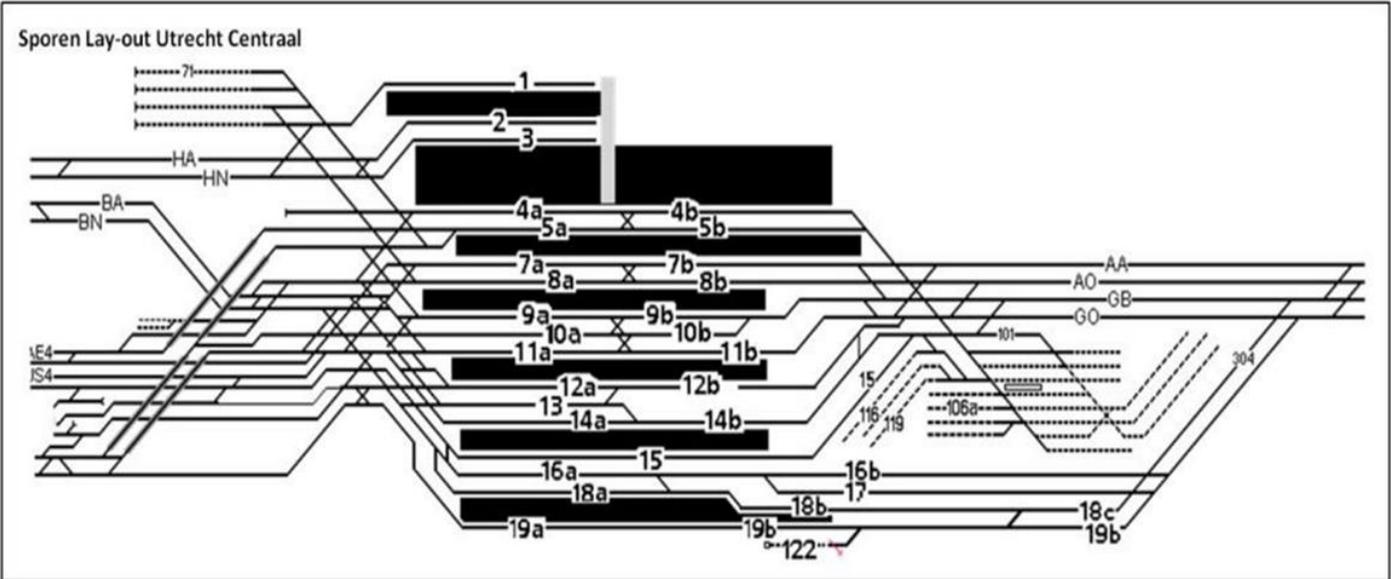
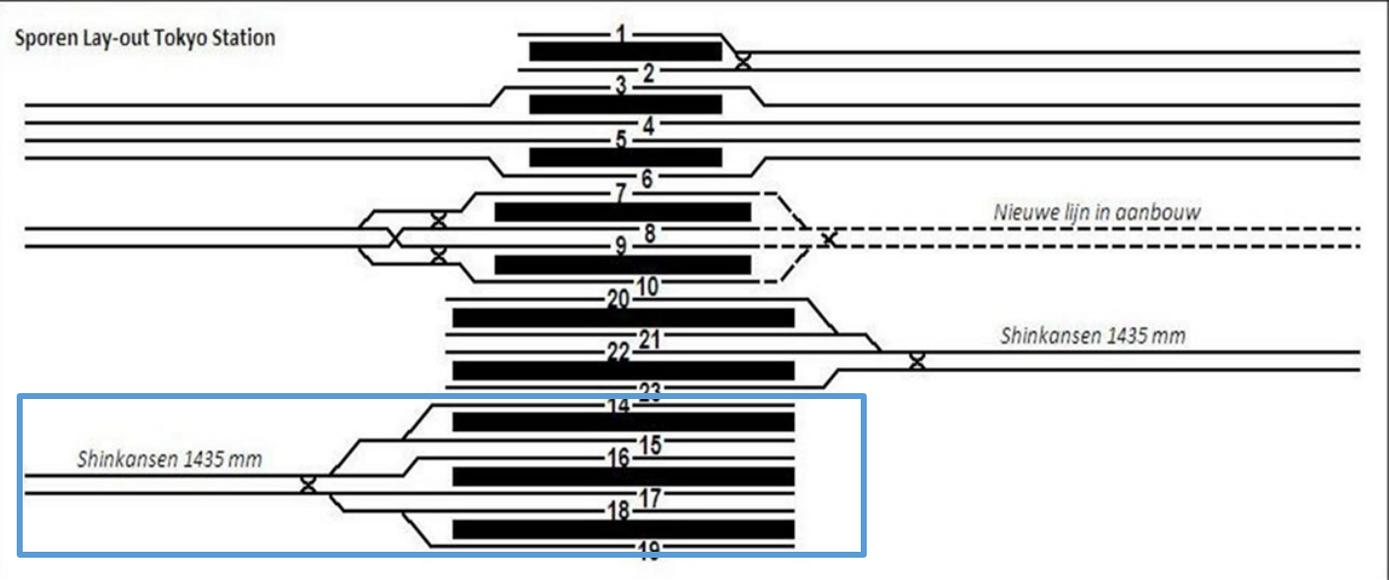


A single level with baggage storage distributed across the entire train.



Stairs slow the boarding process down.

Speed up train movements by simplifying track layout.



Also just scratching the surface...

Fast trains aren't the point.
The Shinkansen is a very fast system.



Shinkansen Conductor
(Tokyo Station, 1990)

Masahiro Nakayama

Managing Director
JR Central Hotels

- 36 years of service with Central Japan Railway and its group corporations
- Joined various development projects and management especially in the hospitality business
- In charge of international affairs for JR Central and assigned to Washington DC Representative Office (2015 to 2021).
- MPS (Hotel Administration), Cornell University

What role and value does the Shinkansen play in Japan's transportation system?

Japan's Economic Artery Tokyo-Nagoya-Osaka

- 60 percent of the population
- 65 percent of GDP

61 Years of Operations

- Travel Efficiency
- Regional development throughout the nation
- Major driving force of economic growth



Tokaido Shinkansen by JR Central

- **Safety:** **ZERO** fatal accident since 1964
- **Reliability:** **1.4 minutes** average delay (2024)
- **Frequency:** **383 average** daily departures
- **Mass Capacity:** A 16-car EMU set with 1,323 seats
- **High-Speed:** **177 MPH** maximum speed
- **Environmental Friendliness:** Low CO2 emission
- **Spaciousness:** 3x2 seatings (rotating)
- **Comfort:** Minimum vibration & noise



**How does TOD get applied to
Shinkansen, across both the big and
small cities?**

Diverse Business Portfolio of JR-Central

2024 Fiscal Performance

- Operating Revenue: USD 11.9 billion
- Net Profit: USD 2.9 billion



High-Speed Rail 75%



Conventional Rail 6%

Non-rail businesses are real estate, retails, and travel-related development & operations:

- Station buildings
- Shopping malls & department stores
- Hotels, resorts and restaurants
- Travel agencies

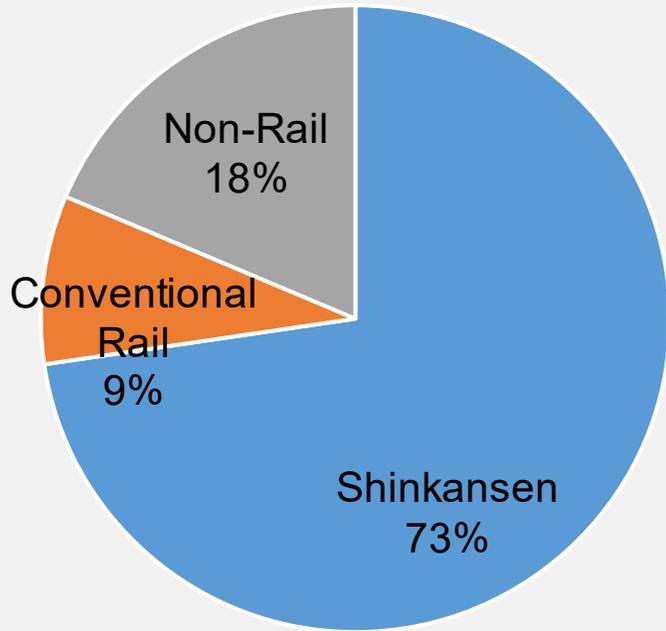
Synergy and interdependency

Non-Rail 19%



Japanese Operators' Dependency on Non-Rail Revenue

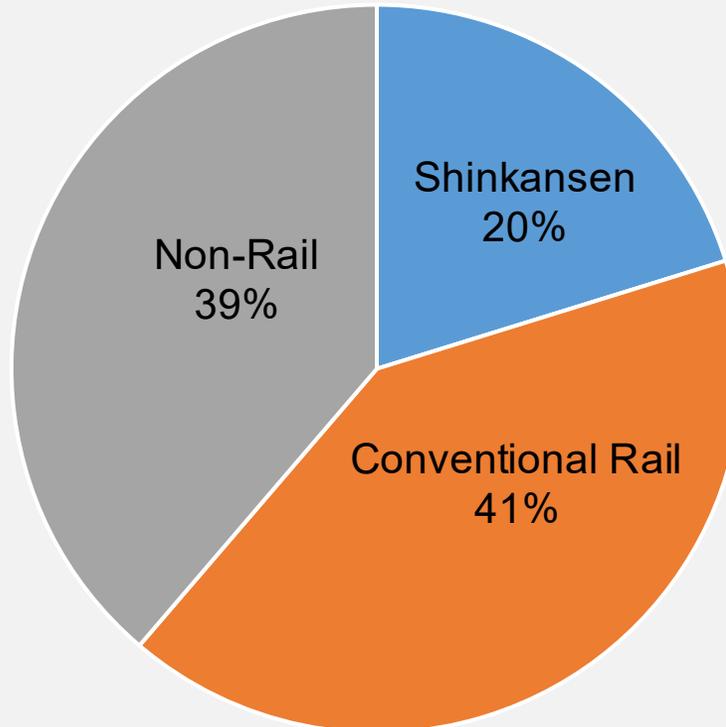
JR Central



2024 Operating revenue

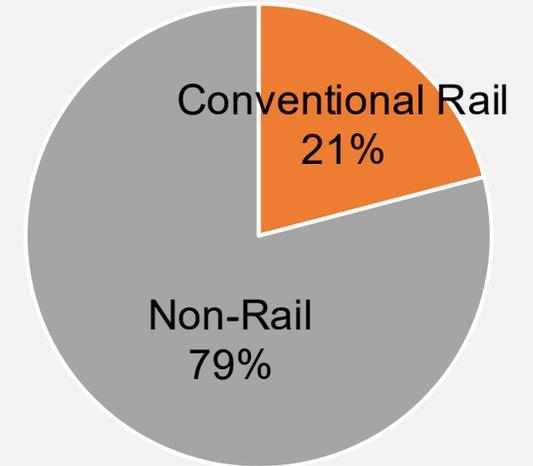
USD 12.0 billion

JR East



USD 18.9 billion

Tokyu



USD 6.9 billion

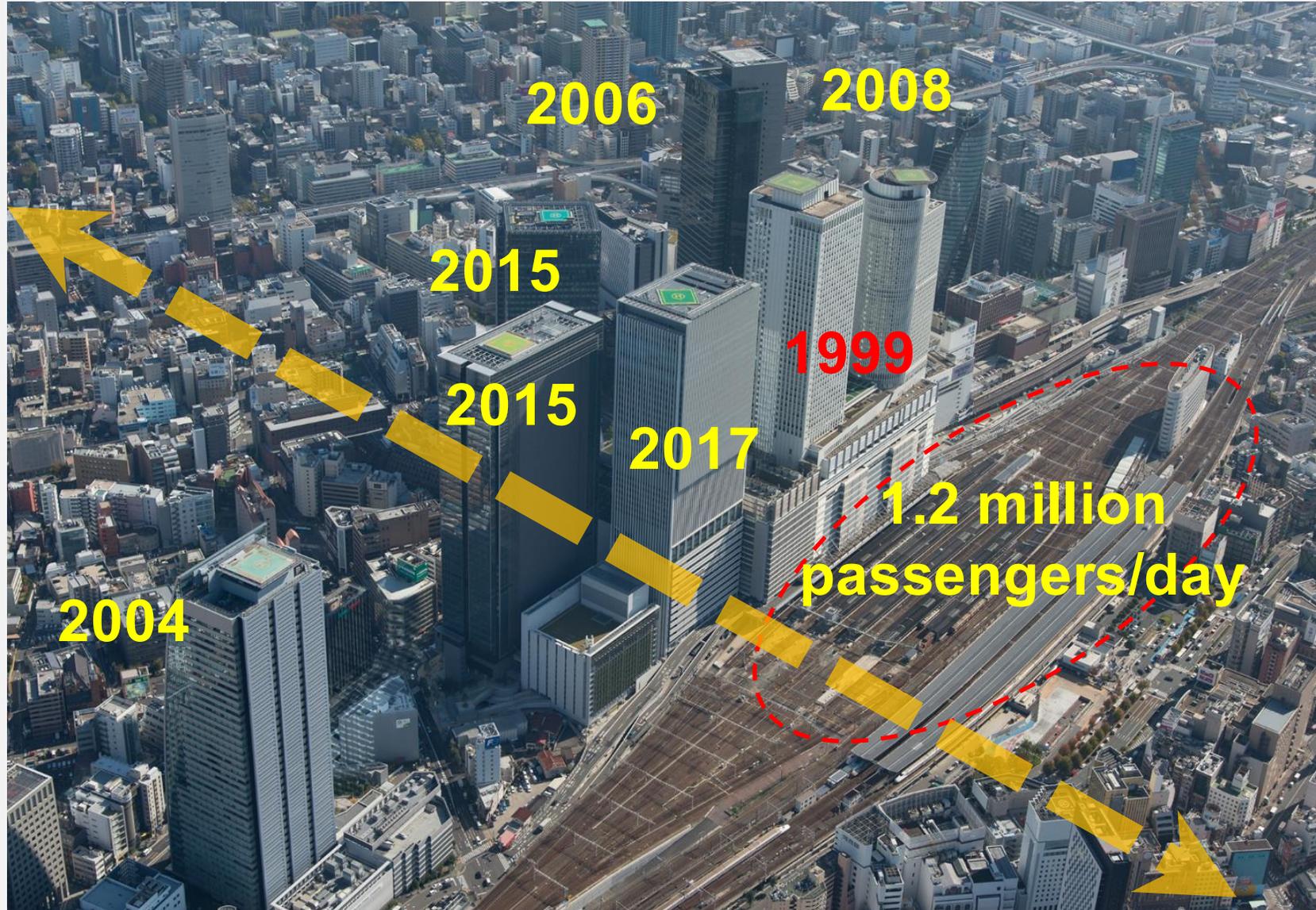
Nagoya Station as a City Hub

Current Services

- Intercity High Speed Rail (JR Shinkansen)
- Commuter Rail (JR and local operators)
- Subway
- Highway Coach
- Commuter Bus

Under Construction

- SCMaglev (JR)



JR Nagoya Station TOD

JR Central Towers
1999

JR Gate Tower
2017

Upscale Market
Driven

Mid Market
Focused



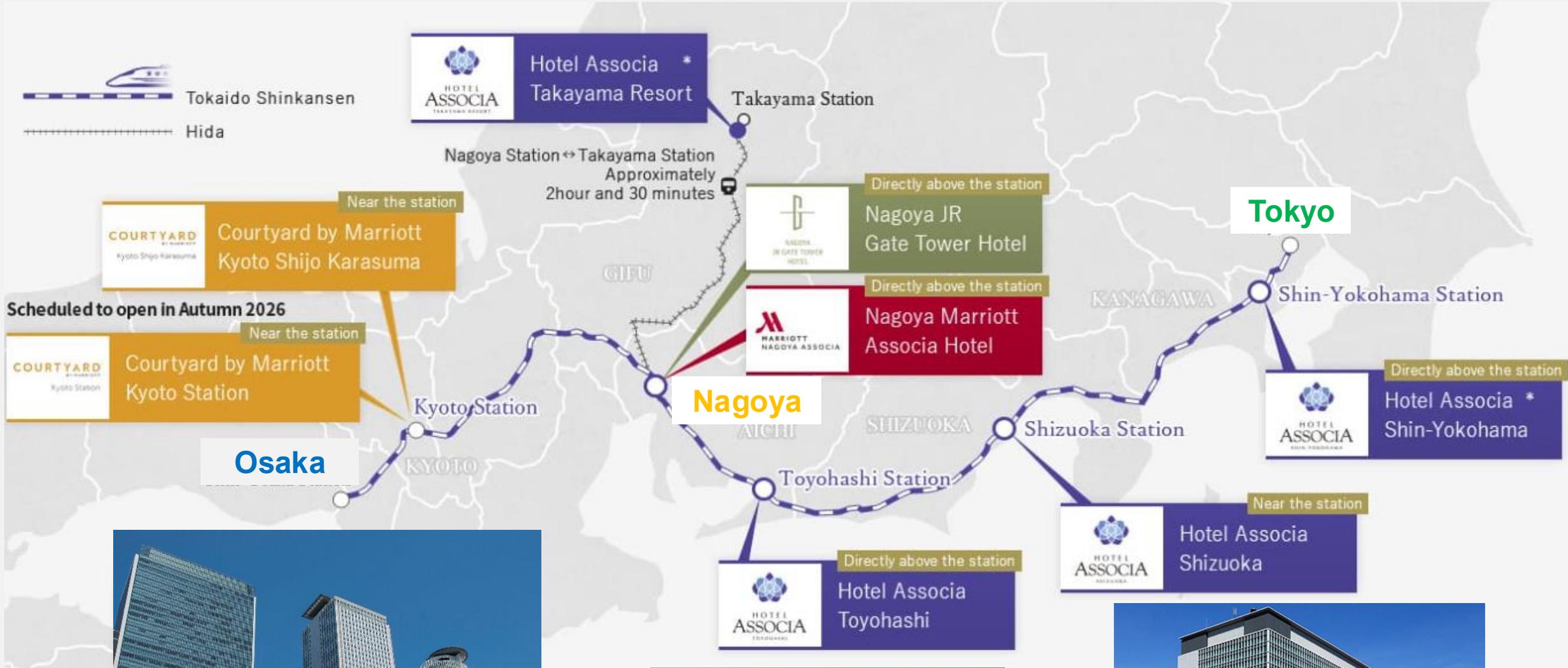


Nagoya Marriott Associa Hotel

- Occupies one of twin buildings of the JR Central Towers
- Opened in 2000 as Marriott's 2001st property
- Owned and operated by JR Central group under a franchise agreement with Marriott
- 748 guestrooms, double executive lounges and eight restaurants & bars
- Flagship of JR Central Hotels

Brand Value

Marriott International, Inc. 2000 Annual Report

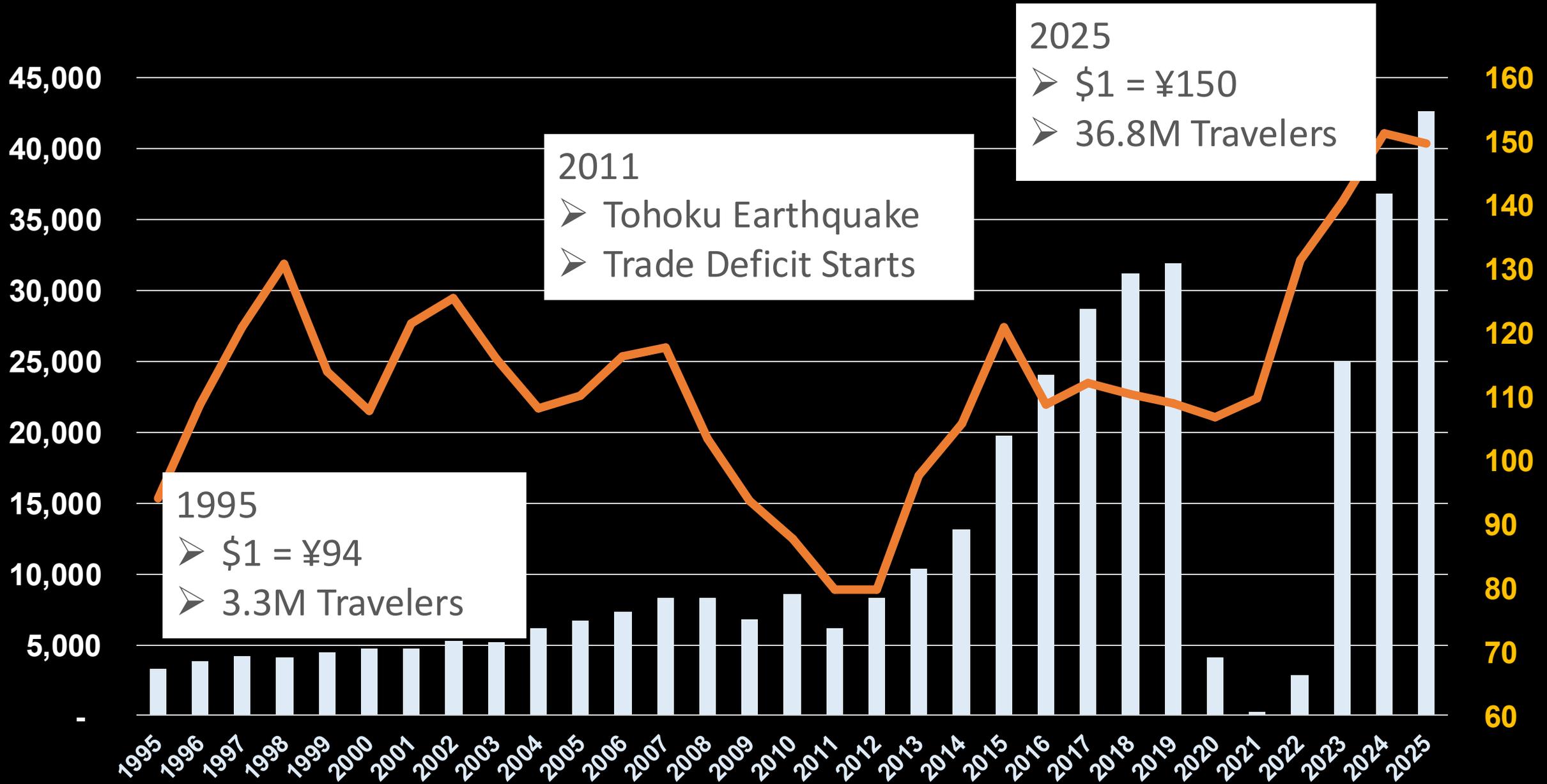






How is Shinkansen being used to serve growing tourism demand?

Inbound Travelers and Dollar/Yen Exchange Rate



Japan-Inbound Tourism

**Manufacturing Business
Competitiveness?**



**"Tourism Nation"
Strategic Policies**

Aging Society



**The "Weak Yen"
Advantage**

Rail Service for Inbound Travelers

新幹線 (静岡・東京 方面) Shinkansen (for Shizuoka, Tōkyō)				
列車名 Train	列車番号 Train No.	時刻 Time	行先 Destination	番線 Tracks
HIKARI ひかり	510	14:43	Tōkyō とうきょう	15
NOZOMI のぞみ	390	14:49	Tōkyō とうきょう	14
NOZOMI のぞみ	26	14:57	Tōkyō とうきょう	15
NOZOMI のぞみ	236	15:06	Tōkyō とうきょう	14
KODAMA こだま	732	15:08	Tōkyō とうきょう	15

Non-Reserved Car	Stops
No.1-5	Nagoya Hamamatsu Shizuoka Mishima Shin-Yokohama Shinagawa Tokyo
No.1,2	Nagoya Shin-Yokohama Shinagawa Tokyo
No.1,2	Nagoya Shin-Yokohama Shinagawa Tokyo
No.1,2	Nagoya Shin-Yokohama Shinagawa Tokyo
No.1-6, 15,16	Nagoya (Stops at all stations) Tokyo



Boosting Travel Convenience & Capacity



Seamless Travel & Digitalization

AI & Multilingual Communication





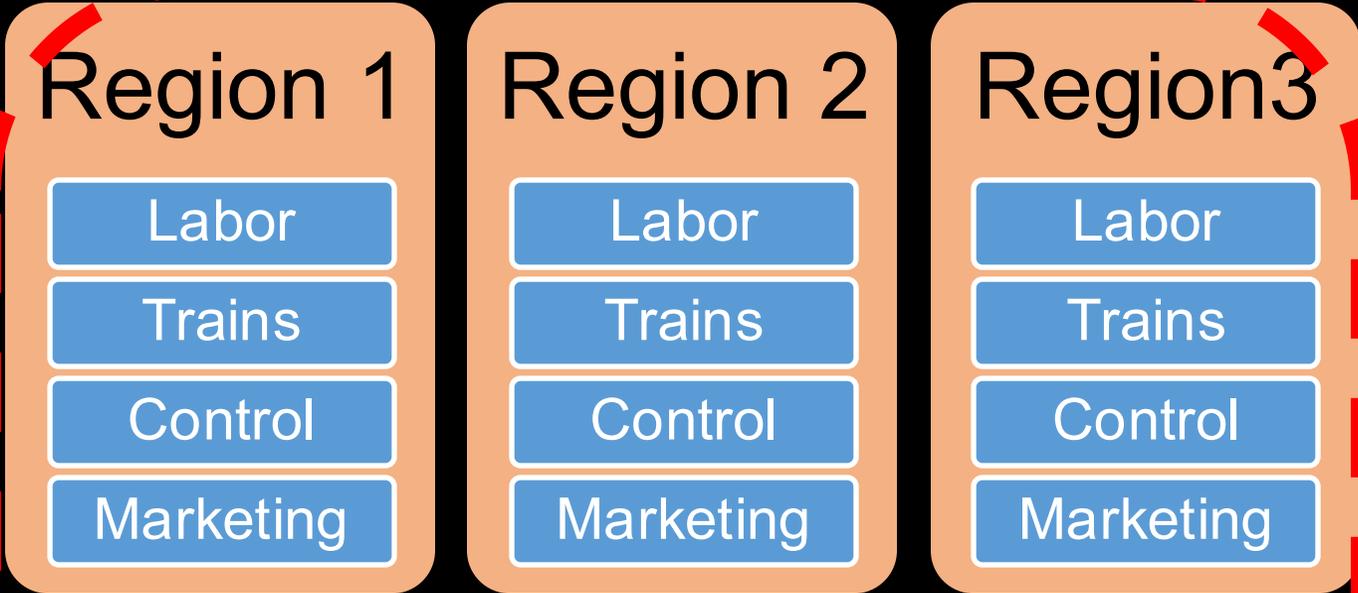
Questions & Answers!



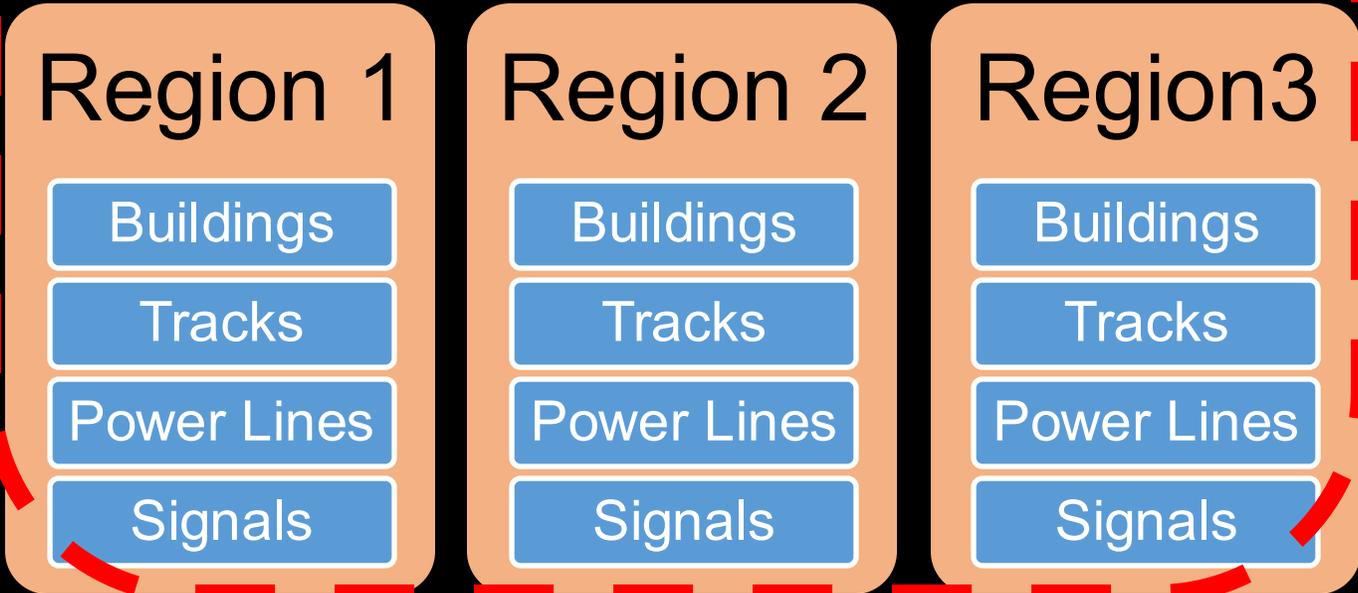
**“Operationally integrated but
institutionally decentralized”**

Classic National Railroads (Japan, UK, EU nations)

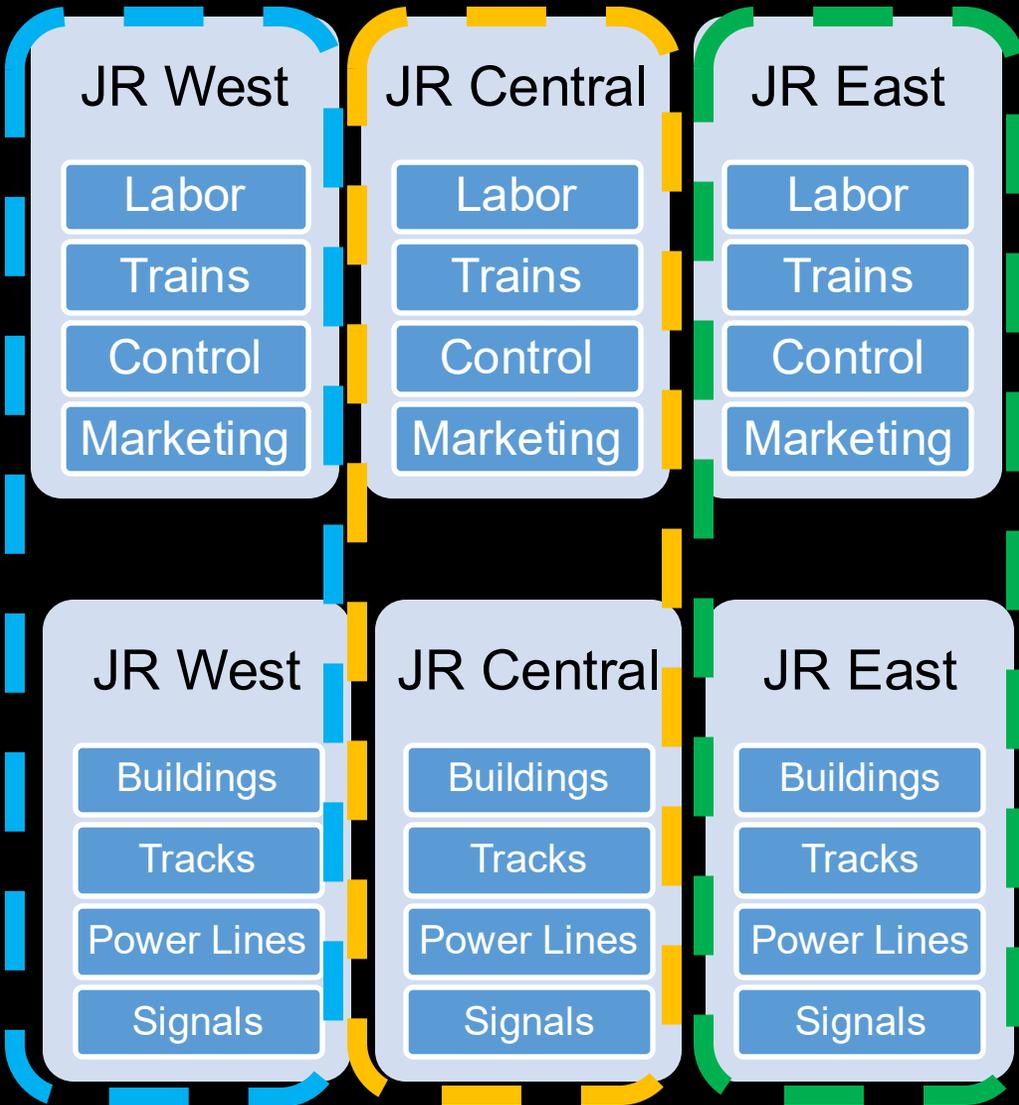
Operations



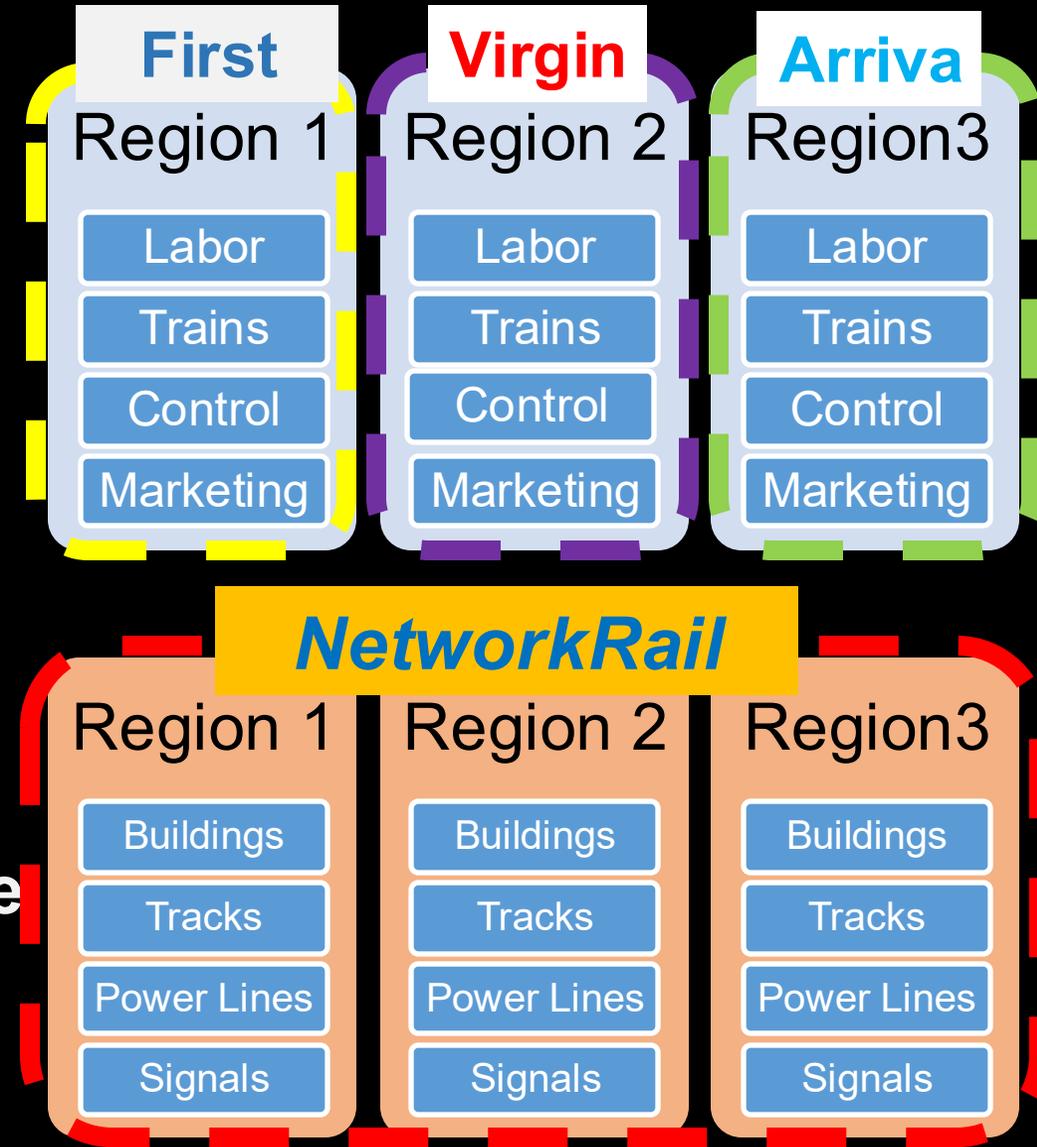
Infrastructure



Vertical Integration (Japanese Privatization)



Horizontal Integration (UK Privatization)



Operations

Infrastructure

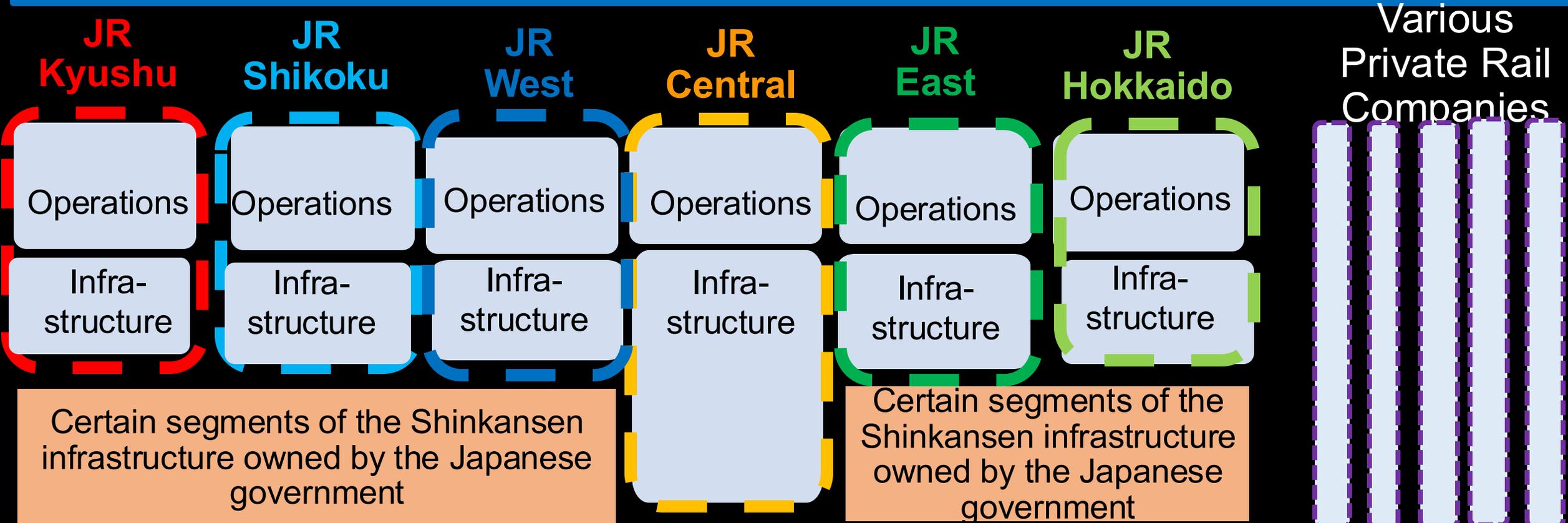
“institutionally decentralized but shares common marketing platform”

Suica (and equivalents)

Prepaid Transit IC Cards for Daily/Monthly Commuter Payment

MARS

Central Reservation System for Mid-Long Distance/Through Service Trains



Development decision making criteria based on long-term planning and strategy

Shinkansen Project Scheme

In 1996, **five (5) criteria** had been established by the Japanese government and the ruling parties for new construction of the Shinkansen lines.

1. Financial agreement National government 2/3 : Local government 1/3
2. Rail operator profitability > 0 (over the next 30 years)
3. Benefit/Cost > 1 (Travel time reduction, regional economic growth)
4. JR agreement as the operating entity
5. Local government consent for conventional lines termination

