



Vietnam traffic seminar
December 18, 2023
at Meliá Hanoi

Railway Development in Japan

EGUCHI Shuji,

Executive Director,

Japan Railway Construction, Transport and Technology Agency



Japan Railway Construction, Transport and Technology Agency

- 1. History of Railway Development in Japan — p.3 - p.6**
- 2. High-Speed Railway (Shinkansen Lines) — p.7 - p.39**
 - (1) Present Situation of Shinkansen Lines — p.7 - p.16**
 - (2) Characteristics of Shinkansen Lines — p.17 - p.23**
 - (3) Construction Scheme of Shinkansen Lines — p.24 - p.26**
 - (4) Benefits of Shinkansen Lines — p.27 - p.29**
 - (5) Reference Information for Vietnam — p.30 - p.39**
- 3. Urban Railways — p.40 - p.52**
- 4. Sustainable State of Railways — p.53 - p.61**
- 5. Closing — p.62 - p.64**

- 1. History of Railway Development in Japan — p.3 - p.6**
- 2. High-Speed Railway (Shinkansen Lines) — p.7 - p.39**
 - (1) Present Situation of Shinkansen Lines — p.7 - p.16**
 - (2) Characteristics of Shinkansen Lines — p.17 - p.23**
 - (3) Construction Scheme of Shinkansen Lines — p.24 - p.26**
 - (4) Benefits of Shinkansen Lines — p.27 - p.29**
 - (5) Reference Information for Vietnam — p.30 - p.39**
- 3. Urban Railways — p.40 - p.52**
- 4. Sustainable State of Railways — p.53 - p.61**
- 5. Closing — p.62 - p.64**



Total length: **27,633 km** (HSR: 2,831 km)

Passengers Carried: 69.0 mil. passengers/day

Cargoes Carried: 107.1 k ton

Railway Companies: 217



Name	<u>J</u> apan <u>R</u> ailway Construction, <u>T</u> ransport and <u>T</u> echnology Agency (JRTT)
Founded	March 1964 (Including former era as “Japan Railway Construction Public Corporation (JRCC)”)
Employees	1,454 (As of April 2023)
Characteristics	<ul style="list-style-type: none">•The only public agency for railway construction in Japan•Total management of railway construction by inhouse engineers <p>civil, track, electric, architecture, machinery, etc.</p>

Railway lines by JR TT: Total approx. 3,725 km



Shinkansen HSR



Urban Railway



Subway



Monorail



Maglev
(Magnetic levitation train)



Undersea Tunnel

1. History of Railway Development in Japan — p.3 - p.6
2. High-Speed Railway (Shinkansen Lines) — p.7 - p.39
 - (1) Present Situation of Shinkansen Lines — p.7 - p.16
 - (2) Characteristics of Shinkansen Lines — p.17 - p.23
 - (3) Construction Scheme of Shinkansen Lines — p.24 - p.26
 - (4) Benefits of Shinkansen Lines — p.27 - p.29
 - (5) Reference Information for Vietnam — p.30 - p.39
3. Urban Railways — p.40 - p.52
4. Sustainable State of Railways — p.53 - p.61
5. Closing — p.62 - p.64

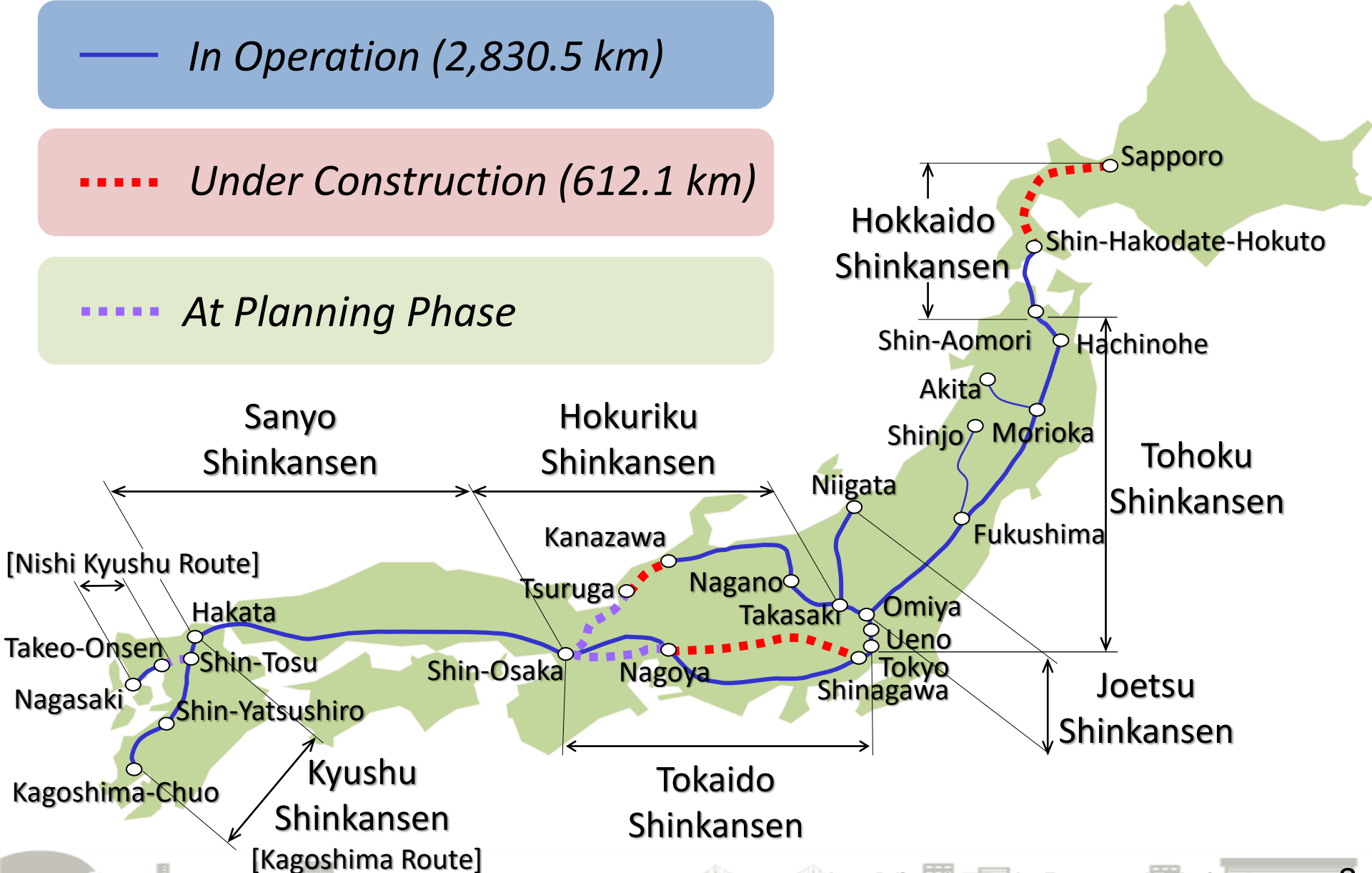
Development of High-Speed Railways in Japan



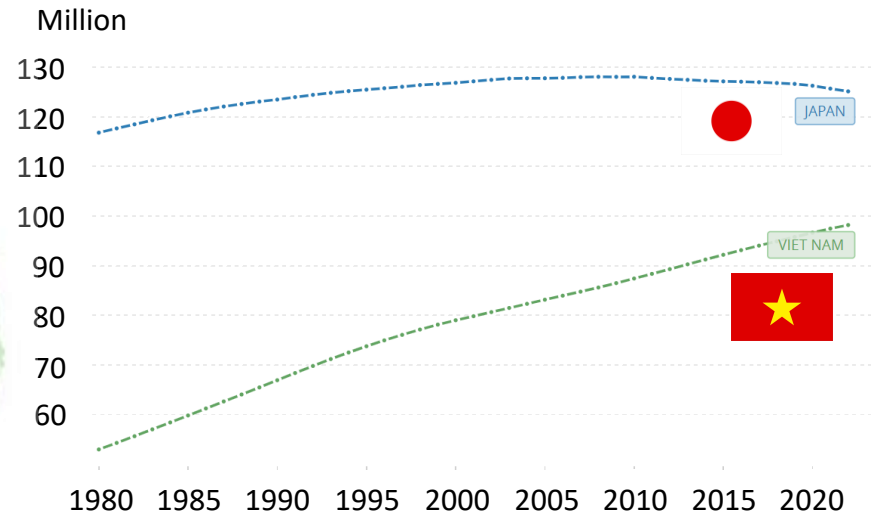
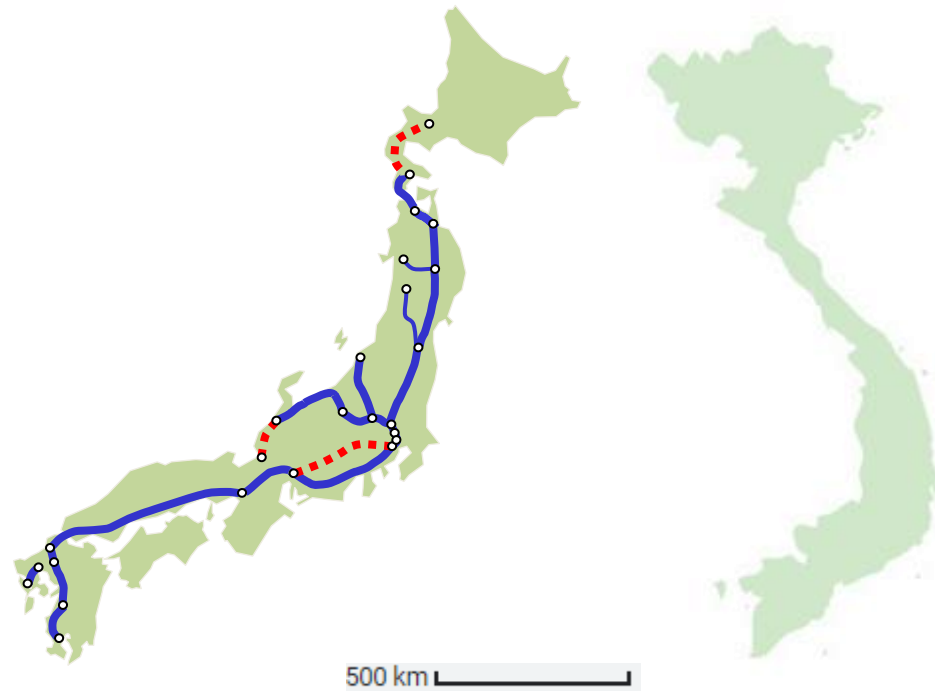
— In Operation (2,830.5 km)

- - - Under Construction (612.1 km)



- - - At Planning Phase



Comparison between Vietnam and Japan



Source : THE WORLD BANK

Country	Area (km ²)	Population (10k people)	Population density (people/km ²)
Vietnam 	331,346 ^{※1}	9,946 ^{※1}	300
Japan 	377,975 ^{※2}	12,495 ^{※2}	331

Source : ※1 JETRO as of 2022 ※2 Statistics Bureau of Japan as of 2022

Tokaido Shinkansen

- Tokaido Shinkansen (515 km), the first high speed railway in the world, started commercial service in 1964
- The entire route of the Sanyo Shinkansen Line (554 km) was opened in 1975 following the Tokaido Shinkansen Line
- Tokaido/Sanyo Shinkansen Lines were constructed as the quadrupling project of existing railways



Sanyo
Shinkansen

Hakata

Shin-Osaka

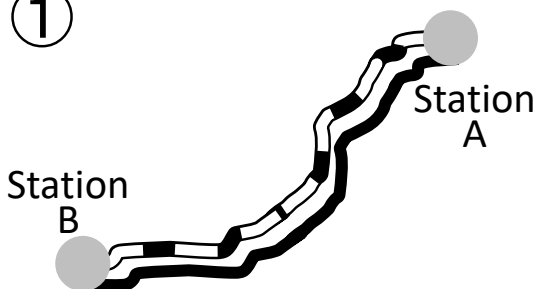
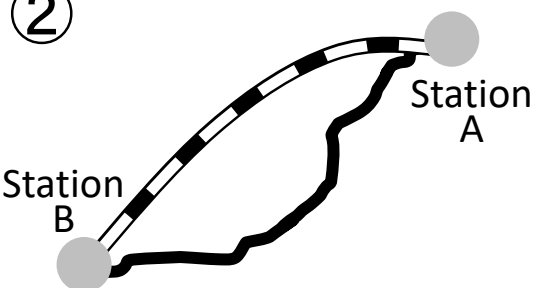
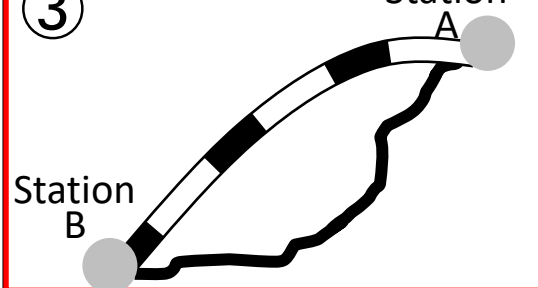
Tokyo

Tokaido
Shinkansen



* Photos available on Wikipedia

History of Tokaido Shinkansen Construction JRTT

	Narrow gauge (1,067 mm)	Standard gauge (1,435 mm)
Parallel with existing railway (Tokaido Line)	<p>①</p> 	
Separate from existing line	<p>②</p> 	<p>③</p> 




Comparison of transportation capacity, travel time, construction cost, construction period, safety, etc.



Proposal ③ was selected

Created by editing the materials from Tokaido Shinkansen Construction Logs (Civil Engineering Volume)

<Legend>

-  Existing railway (narrow gauge)
-  Newly laid track (narrow gauge)
-  Newly laid track (standard gauge)

Conventional Line
(narrow gauge)



1,067 mm

Shinkansen (standard gauge)



1,435 mm



High-speed trains cannot run on the narrow gauge railways because of the difference of gauge.

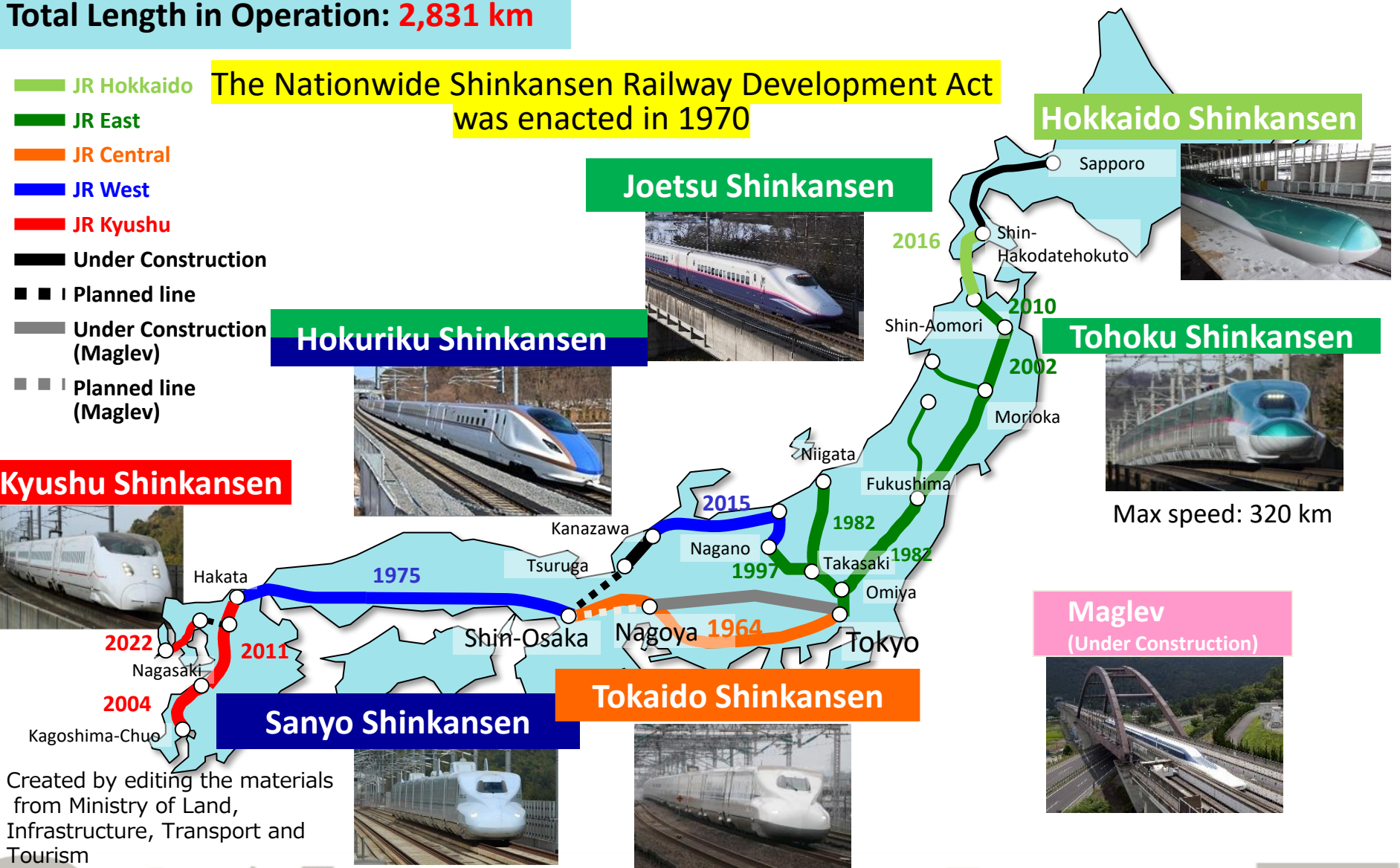
Overview of the Shinkansen Network in Japan



Total Length in Operation: **2,831 km**

- JR Hokkaido
- JR East
- JR Central
- JR West
- JR Kyushu
- Under Construction
- | Planned line
- Under Construction (Maglev)
- | Planned line (Maglev)

The Nationwide Shinkansen Railway Development Act was enacted in 1970



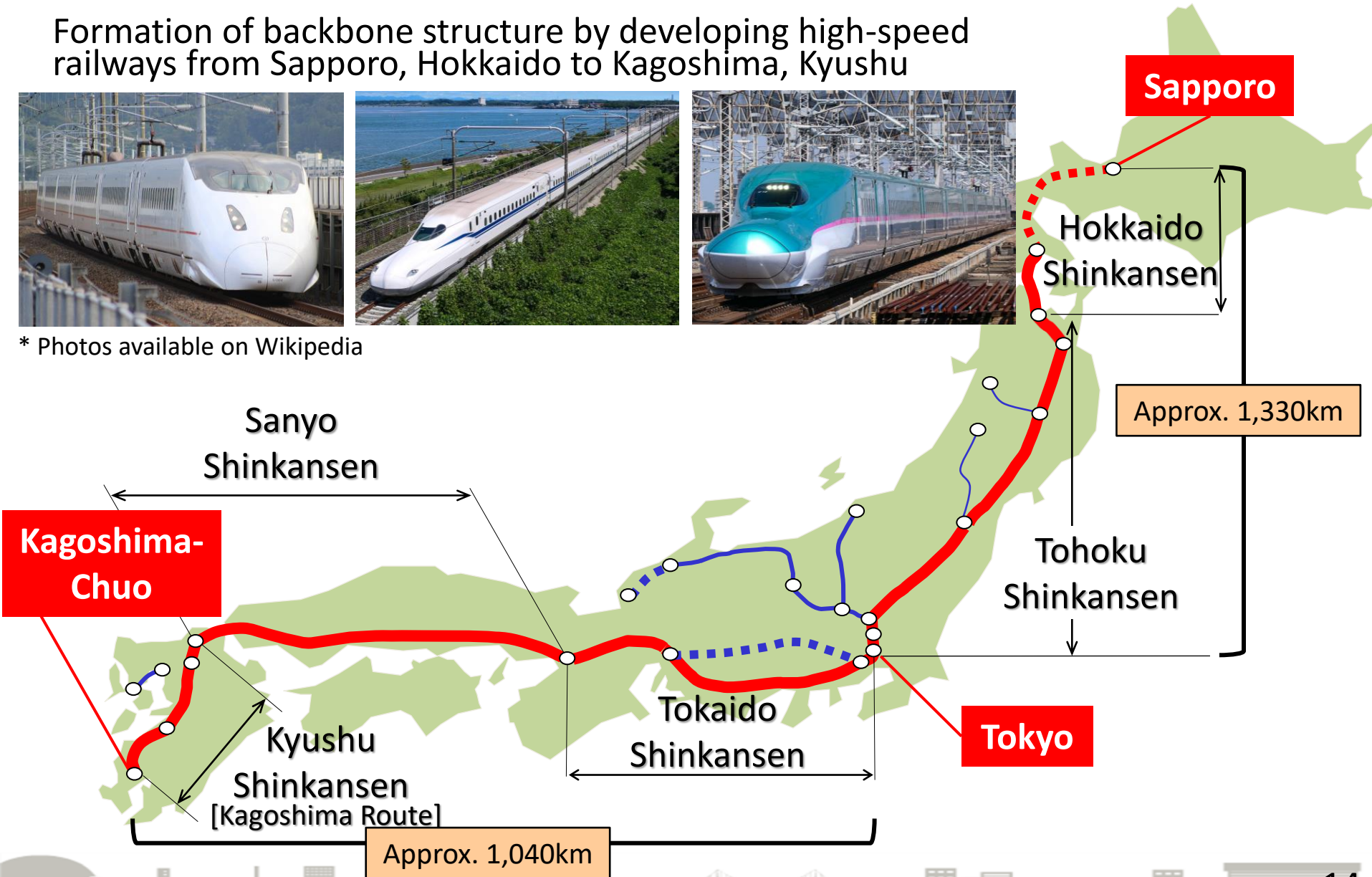
Created by editing the materials from Ministry of Land, Infrastructure, Transport and Tourism

Features of the Shinkansen Network ①: Formation of Backbone

Formation of backbone structure by developing high-speed railways from Sapporo, Hokkaido to Kagoshima, Kyushu

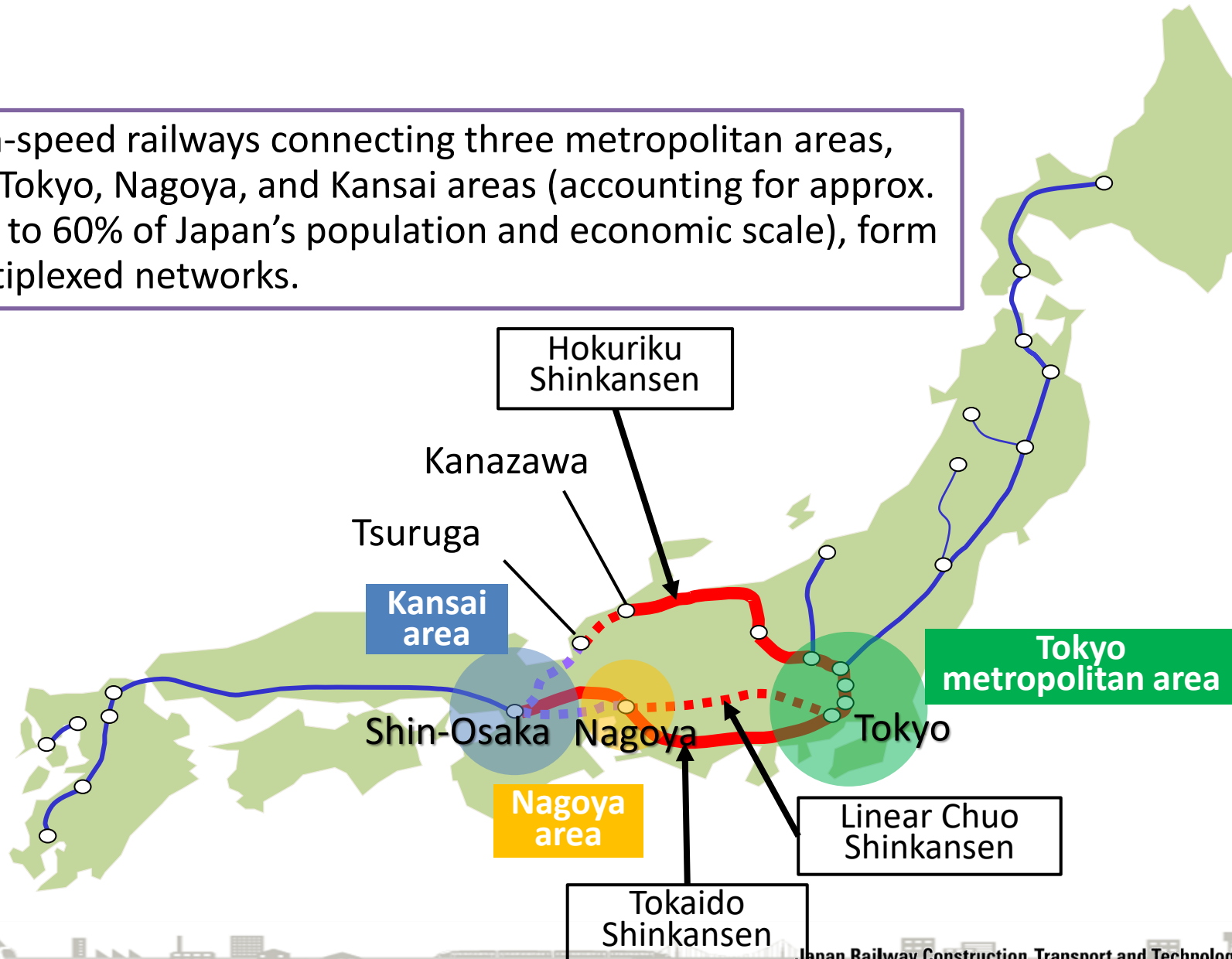


* Photos available on Wikipedia



Features of the Shinkansen Network ②: multiplexing

High-speed railways connecting three metropolitan areas, i.e., Tokyo, Nagoya, and Kansai areas (accounting for approx. 50% to 60% of Japan's population and economic scale), form multiplexed networks.



1. History of Railway Development in Japan — p.3 - p.6
2. **High-Speed Railway (Shinkansen Lines) — p.7 - p.39**
 - (1) Present Situation of Shinkansen Lines — p.7 - p.16
 - (2) Characteristics of Shinkansen Lines — p.17 - p.23**
 - (3) Construction Scheme of Shinkansen Lines — p.24 - p.26
 - (4) Benefits of Shinkansen Lines — p.27 - p.29
 - (5) Reference Information for Vietnam — p.30 - p.39
3. Urban Railways — p.40 - p.52
4. Sustainable State of Railways — p.53 - p.61
5. Closing — p.62 - p.64

① Safety

The number of fatal accidents after the start of Shinkansen service: **Zero (0)**

② Reliability

Train delay: **<1 min per train on average**

③ Frequency

Max 17 trains per hour



Tokaido Shinkansen
N700 series

④ Capacity

Number of passengers: **≥1 million per day**

* Air: Approx. 280K per day (FY2018)



Tohoku Shinkansen
E5 series

⑤ High speed

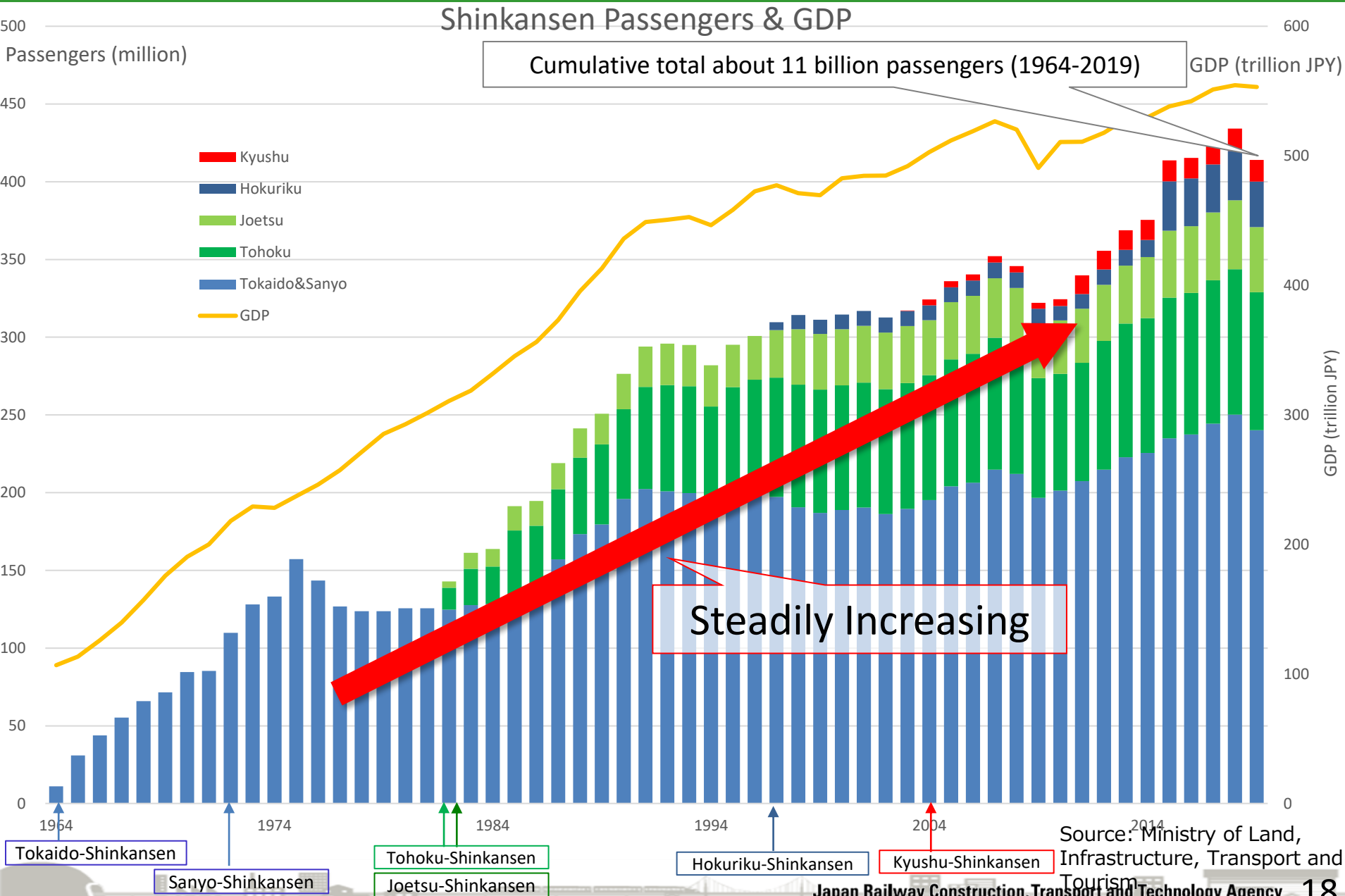
Max speed: **320 km/h**

⑥ Eco friendliness

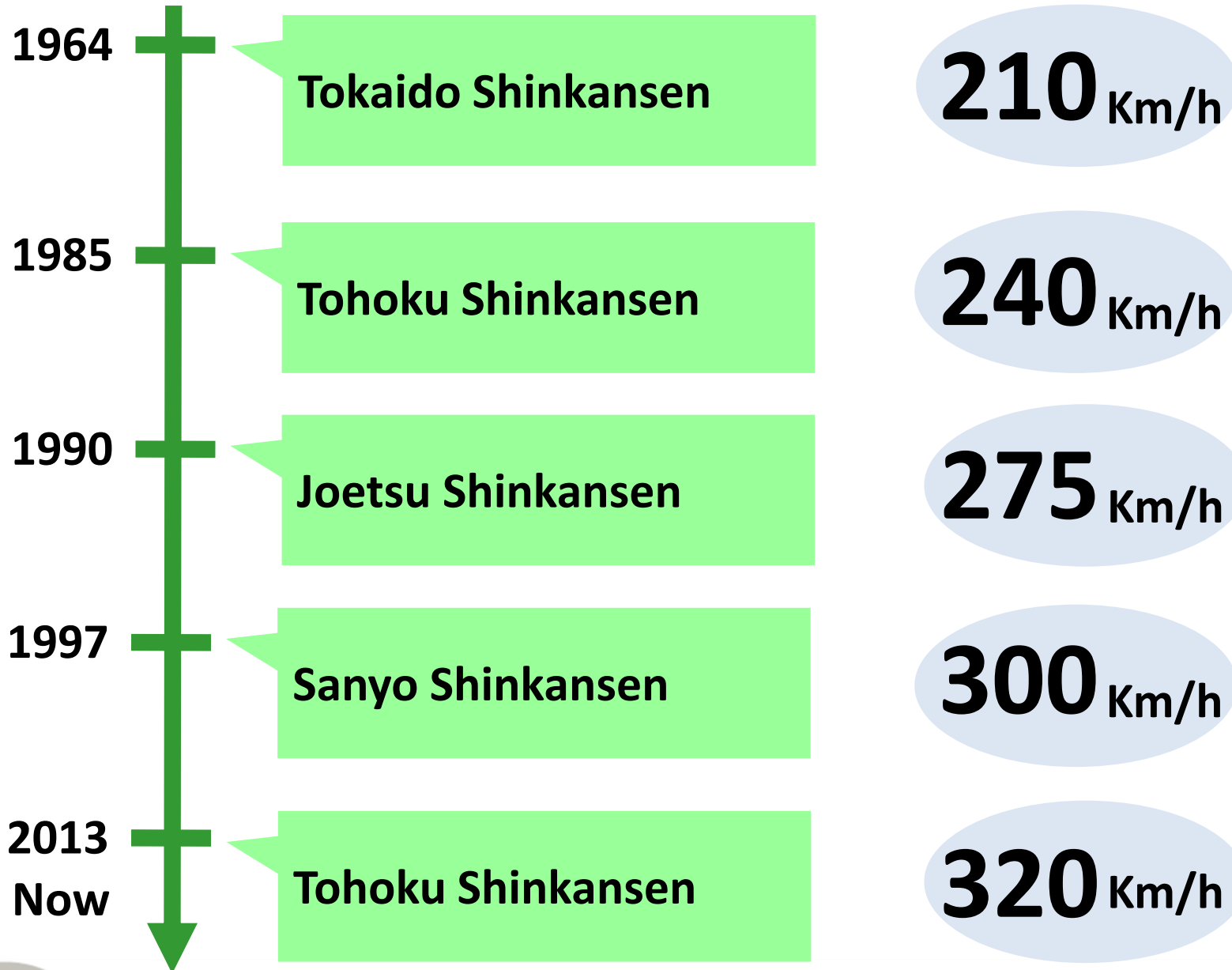
CO2 reduction, strict noise criteria, etc.

Created by editing the materials
(Ministry of Land, Infrastructure, Transport and Tourism)

Annual Change in Shinkansen Passengers



Increase of Maximum Speed of Shinkansen



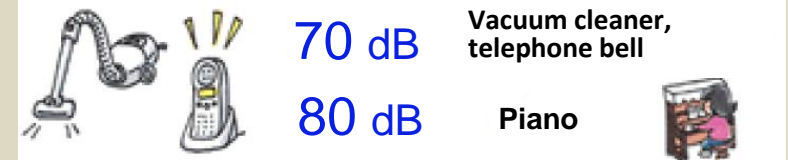
Source: Ministry of Land, Infrastructure, Transport and Tourism

Operation Under Strict Noise Criteria

Noise criteria

- Environmental Quality Standards for Shinkansen Railway Noise (Notification No. 46 of the Environment Agency in July, 1975)

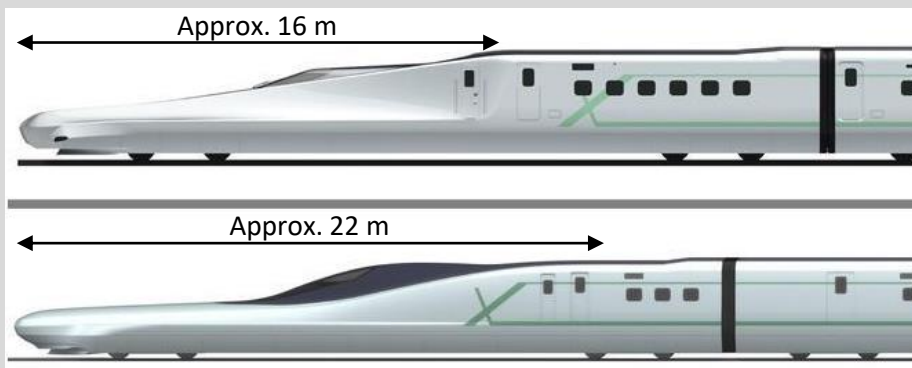
Types of local community	Reference value
I	≤70 dB (A)
II	≤75 dB (A)



Patterns of local community is designated by prefectural governments (I: Mainly residential; II: Commerce and industry)

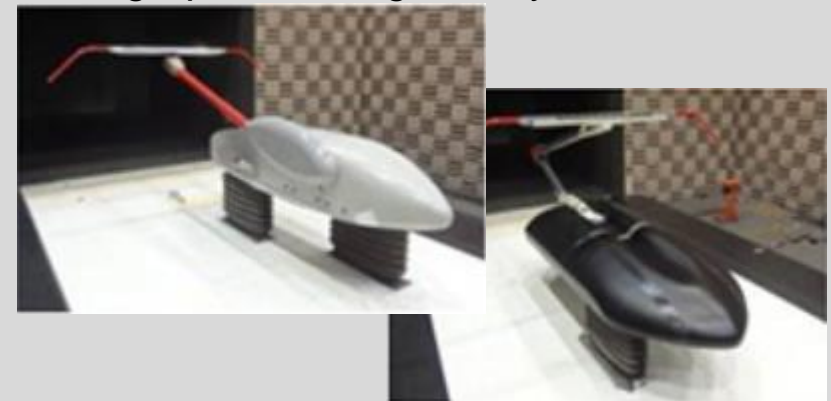
Noise control measures (ALFA-X)

Streamlined train



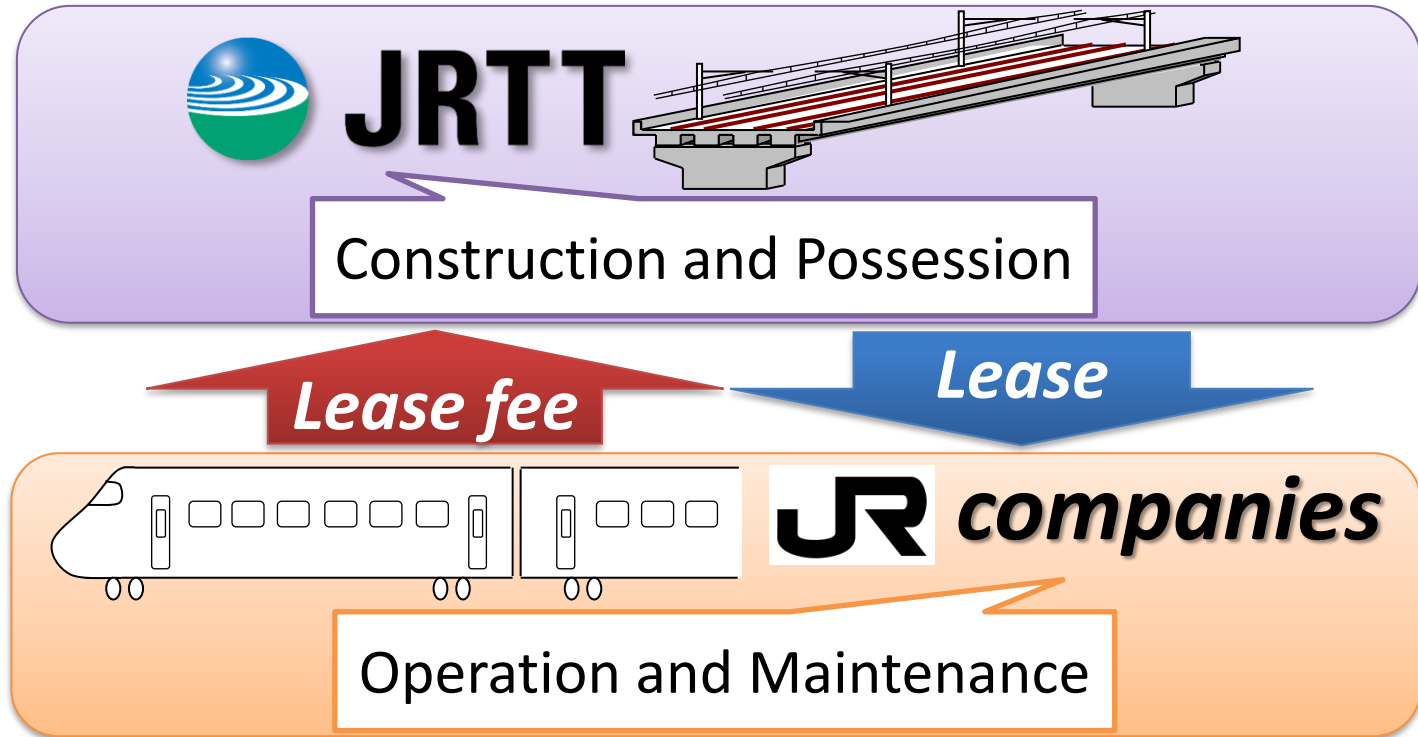
* Source: JR-EAST website

Pantograph reducing aerodynamic noise

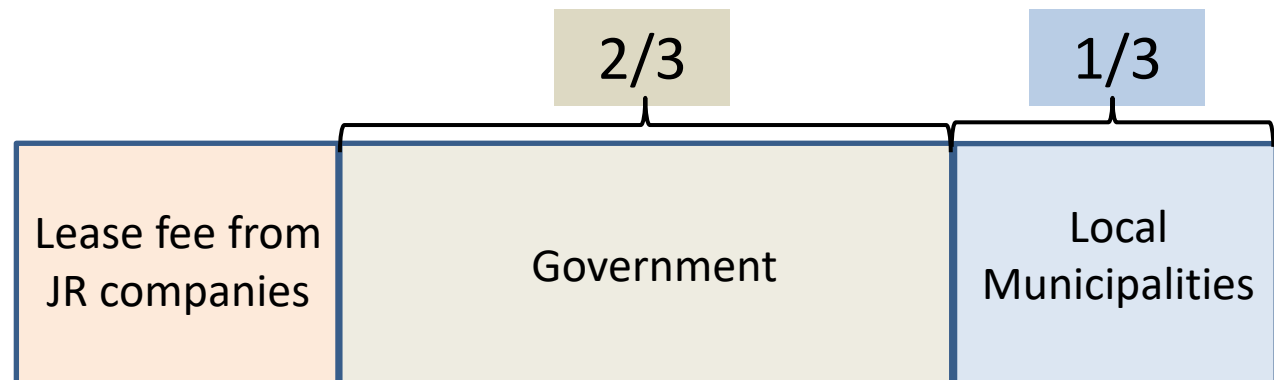


1. History of Railway Development in Japan — p.3 - p.6
2. **High-Speed Railway (Shinkansen Lines) — p.7 - p.39**
 - (1) Present Situation of Shinkansen Lines — p.7 - p.16
 - (2) Characteristics of Shinkansen Lines — p.17 - p.23
 - (3) Construction Scheme of Shinkansen Lines — p.24 - p.26**
 - (4) Benefits of Shinkansen Lines — p.27 - p.29
 - (5) Reference Information for Vietnam — p.30 - p.39
3. Urban Railways — p.40 - p.52
4. Sustainable State of Railways — p.53 - p.61
5. Closing — p.62 - p.64

Vertical Separation Scheme



Funding Scheme



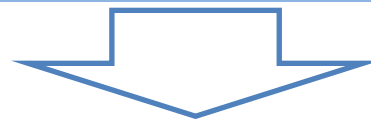
Secure prospect of stable financing

Profitability on income and expenditures
(benefits the finances of operating body on average over 30 years)

Investment benefits (profit / cost > 1)

Consent of JR as the business entity

Consent of local governments along the railway line to separating management of parallel conventional line



Work can start when all of the above conditions have been agreed.

Source: Ministry of Land, Infrastructure, Transport and Tourism

1. History of Railway Development in Japan — p.3 - p.6
- 2. High-Speed Railway (Shinkansen Lines) — p.7 - p.39**
 - (1) Present Situation of Shinkansen Lines — p.7 - p.16
 - (2) Characteristics of Shinkansen Lines — p.17 - p.23
 - (3) Construction Scheme of Shinkansen Lines — p.24 - p.26
 - (4) Benefits of Shinkansen Lines — p.27 - p.29**
 - (5) Reference Information for Vietnam — p.30 - p.39
3. Urban Railways — p.40 - p.52
4. Sustainable State of Railways — p.53 - p.61
5. Closing — p.62 - p.64



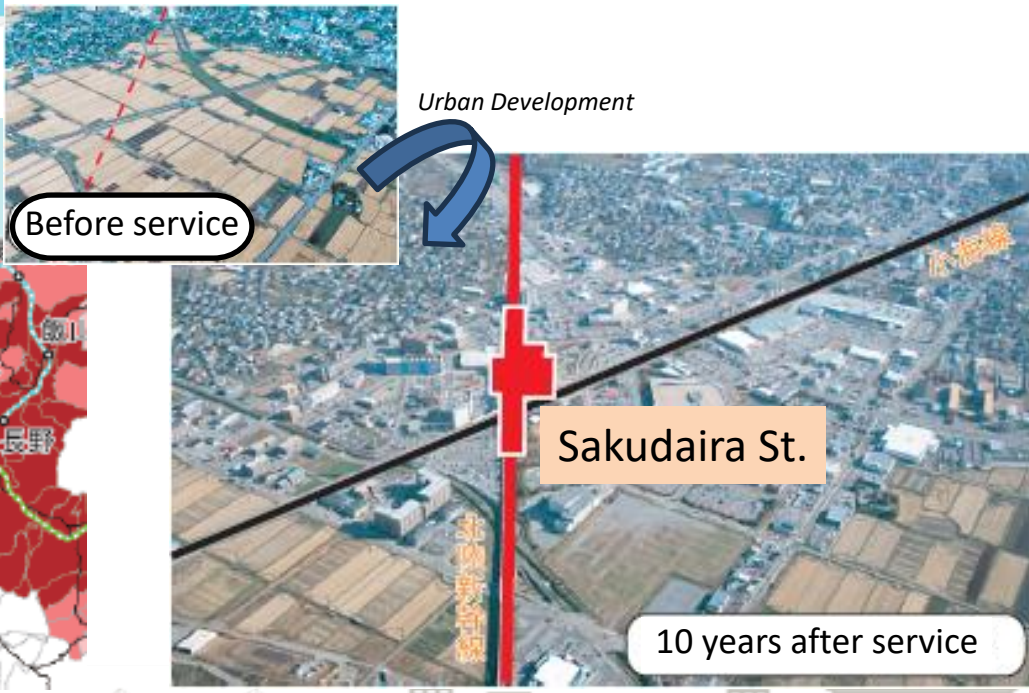
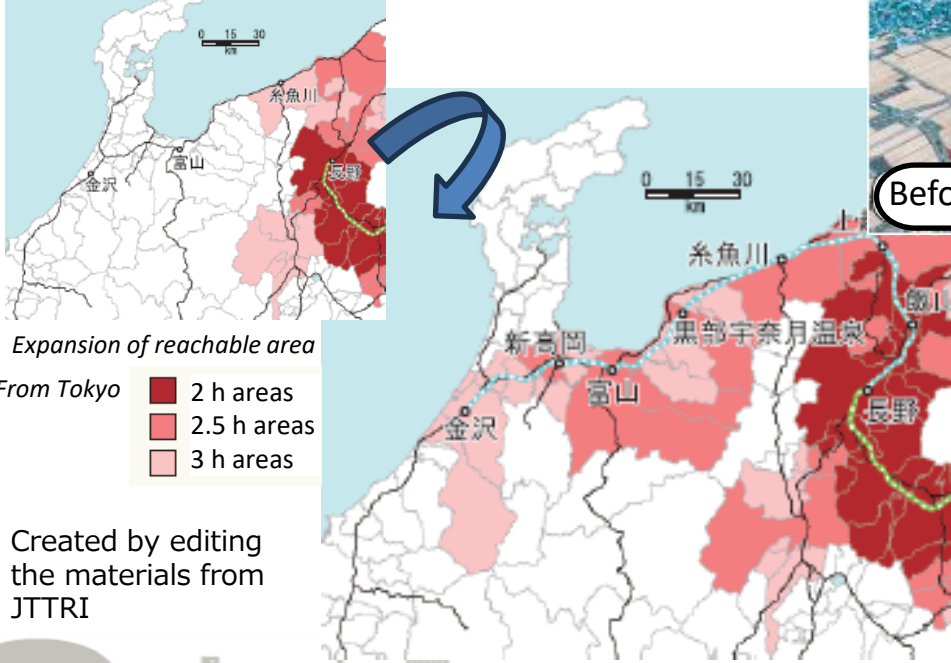
Time reduction of the travel time by the opening of the Hokuriku Shinkansen

Before service:
3h 47min between Tokyo and Kanazawa

↓

1h 20min shortened

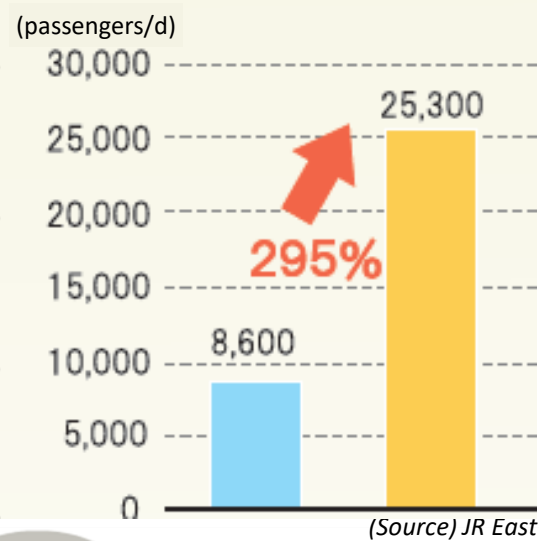
After opening:
2h 27min between Tokyo and Kanazawa



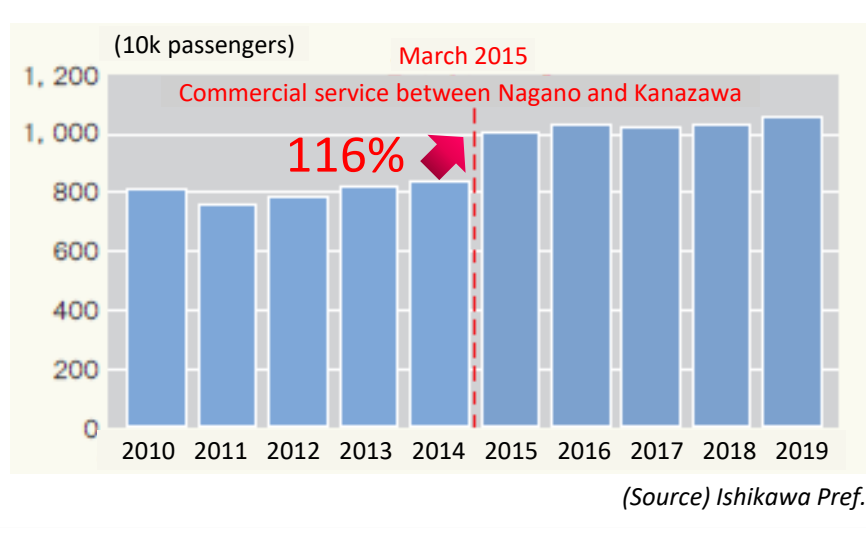
Created by editing the materials from JTTRI



Passengers (using Shinkansen)



Tourists (Kanazawa Area)



Land Value

Station Area
(2014-2015)
+17%

Economic Effect

(2015, estimated)
USD 454 mil
(Consumption by tourists, Ishikawa Prefecture, only)

Source: JTTRI

1. History of Railway Development in Japan — p.3 - p.6
- 2. High-Speed Railway (Shinkansen Lines) — p.7 - p.39**
 - (1) Present Situation of Shinkansen Lines — p.7 - p.16
 - (2) Characteristics of Shinkansen Lines — p.17 - p.23
 - (3) Construction Scheme of Shinkansen Lines — p.24 - p.26
 - (4) Benefits of Shinkansen Lines — p.27 - p.29
 - (5) Reference Information for Vietnam — p.30 - p.39**
3. Urban Railways — p.40 - p.52
4. Sustainable State of Railways — p.53 - p.61
5. Closing — p.62 - p.64

Difference of Gauge

Conventional Line
(narrow gauge)



1,067 mm

Shinkansen (standard gauge)



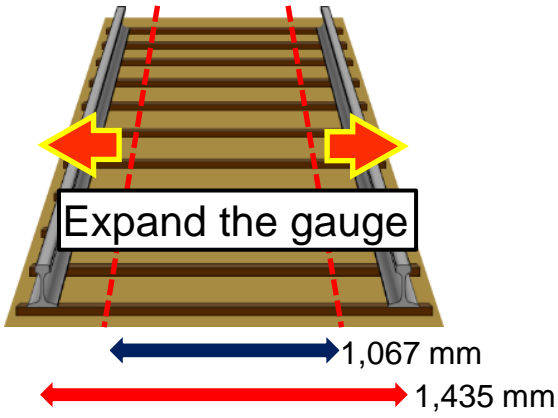
1,435 mm



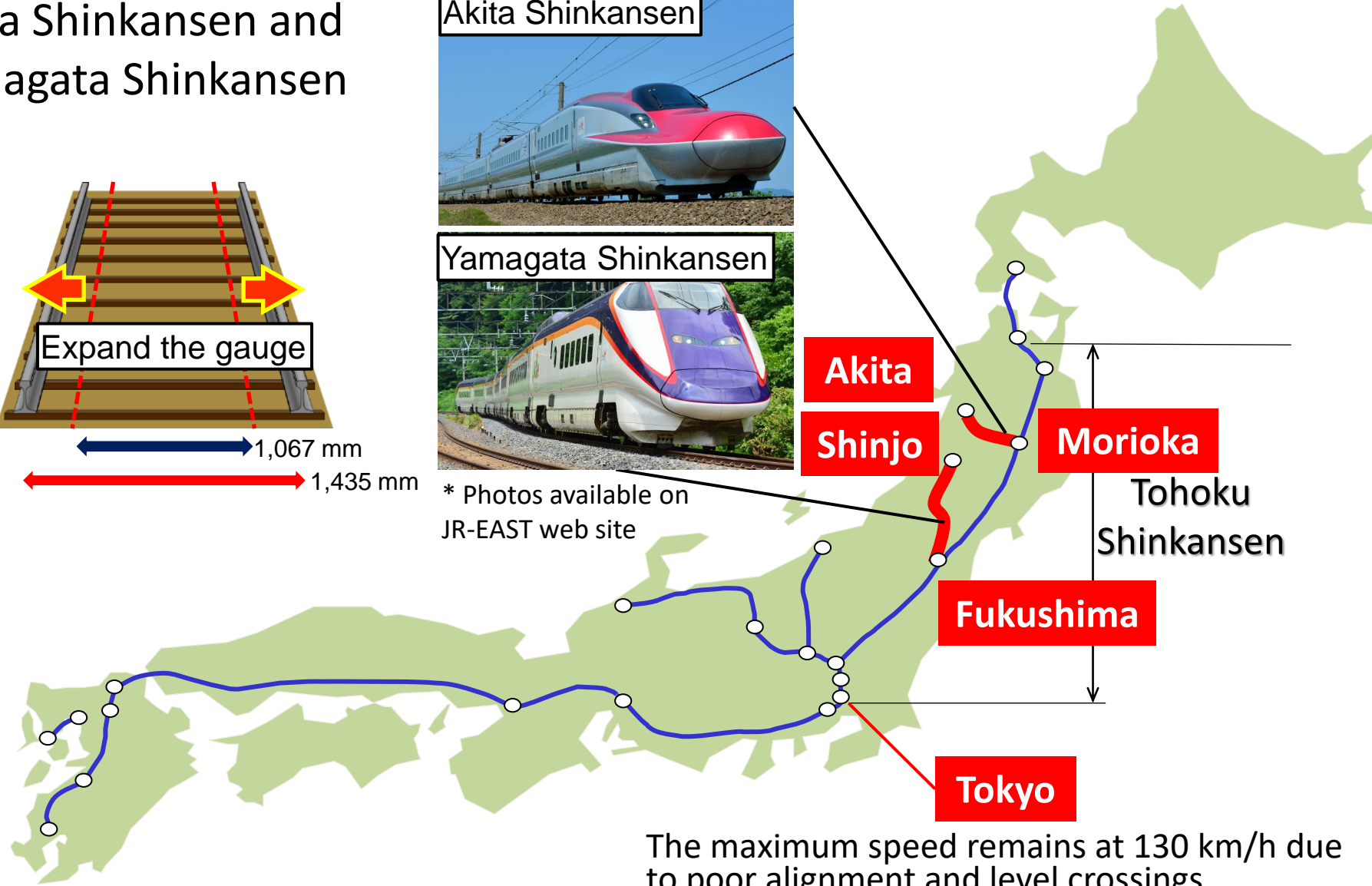
High-speed trains cannot run on the narrow gauge railways because of the difference of gauge.

Difference of Gauge: ① Gauge Expansion

Akita Shinkansen and Yamagata Shinkansen



* Photos available on JR-EAST web site

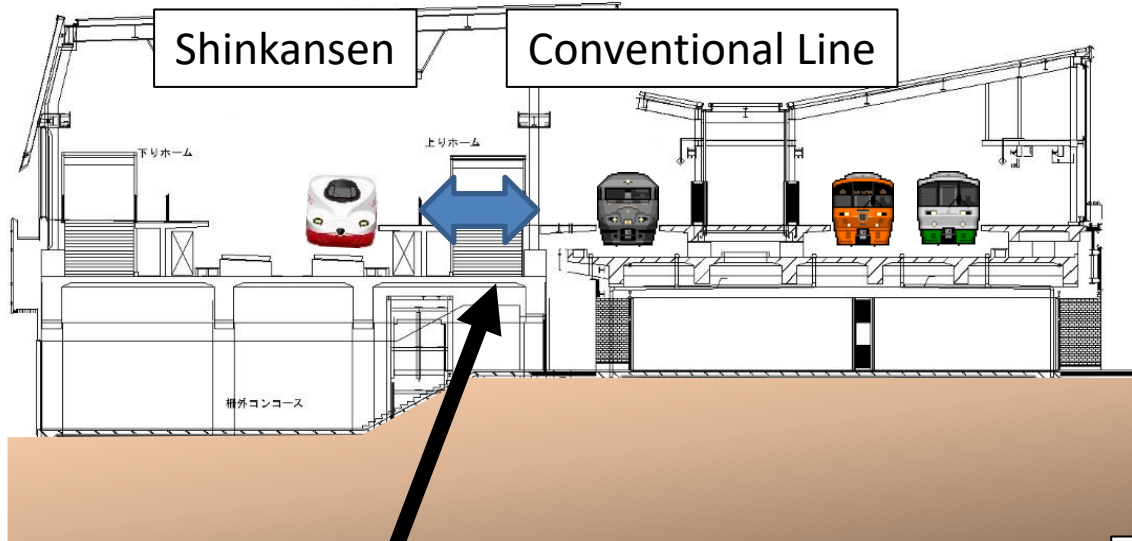


The maximum speed remains at 130 km/h due to poor alignment and level crossings

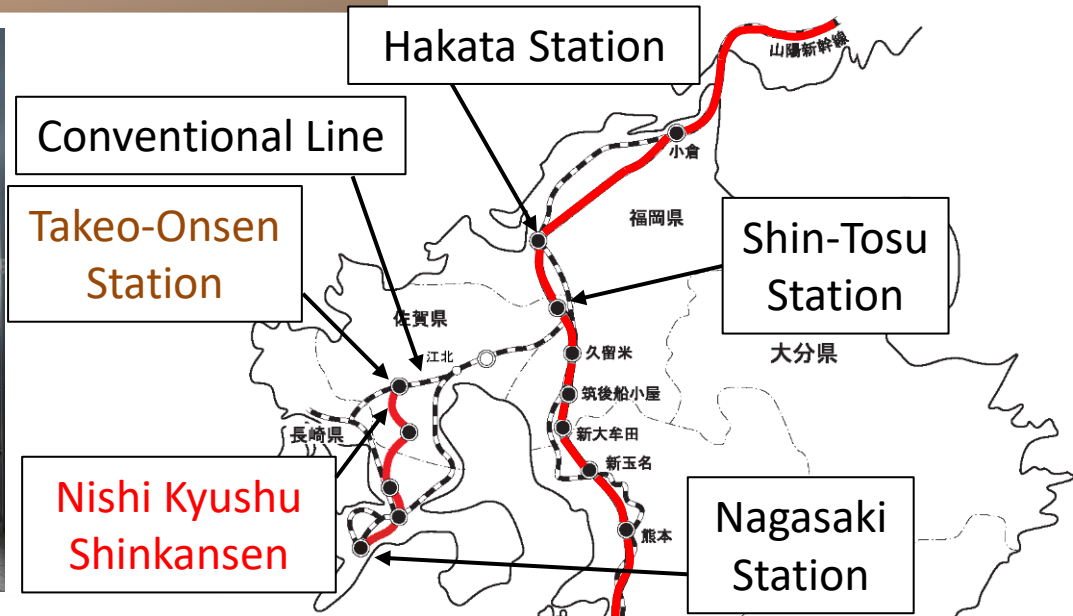
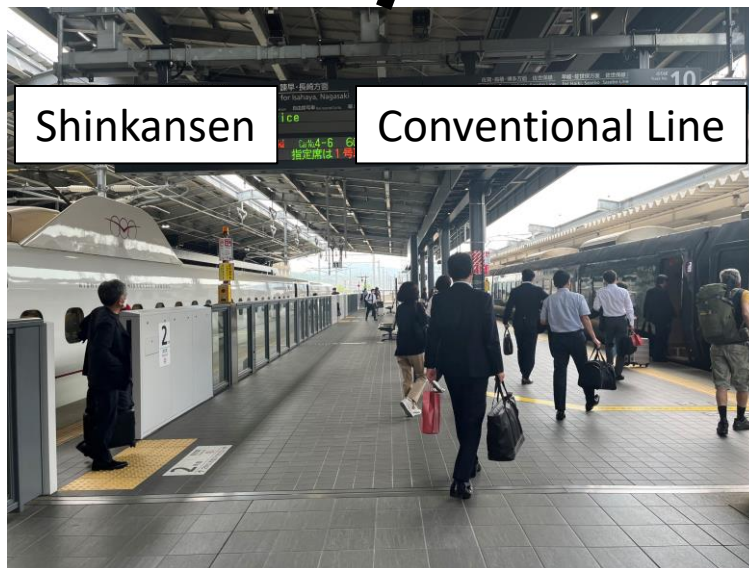
Difference of Gauge:

② Changing Trains on Same Platform

Nishi Kyushu Shinkansen (Takeo-Onsen Station)



Passengers can make a transfer on the same platform at Takeo-Onsen Station



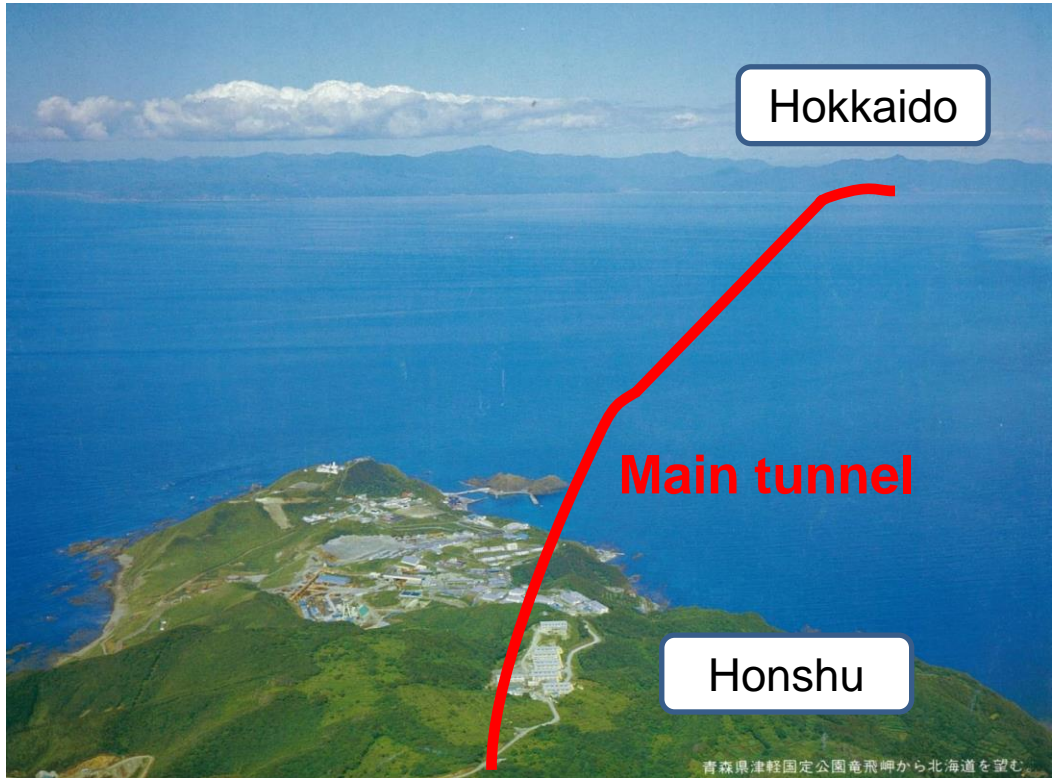
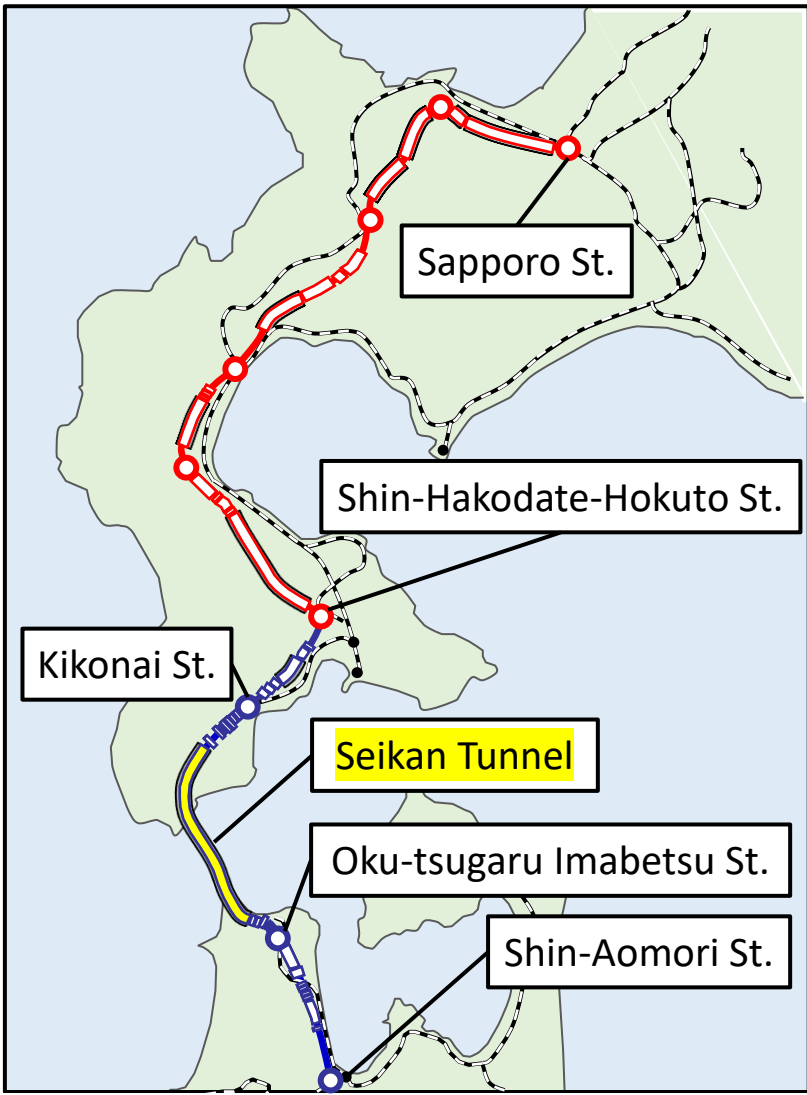
The only zone where cargo trains run on the Shinkansen track in Japan



* Photos available on Imabetsu town web site



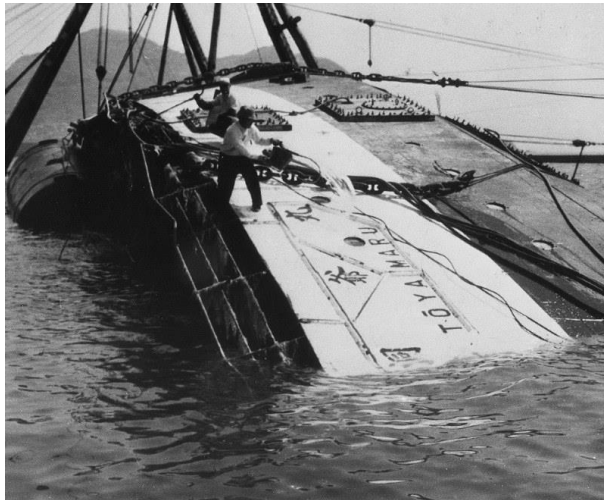
Shinkansen and Cargo Train: Map of Seikan Tunnel JRTT



Shinkansen and Cargo Train: History of Construction of Seikan Tunnel

On September 26, 1954, Toya-maru (ferry) was capsized by a typhoon, which took the lives of 1,155 people.

Request for the construction of the safe land route (Seikan Tunnel) connecting Honshu and Hokkaido considerably increased.



* Source: Disaster archive, Mainichi Shinbun

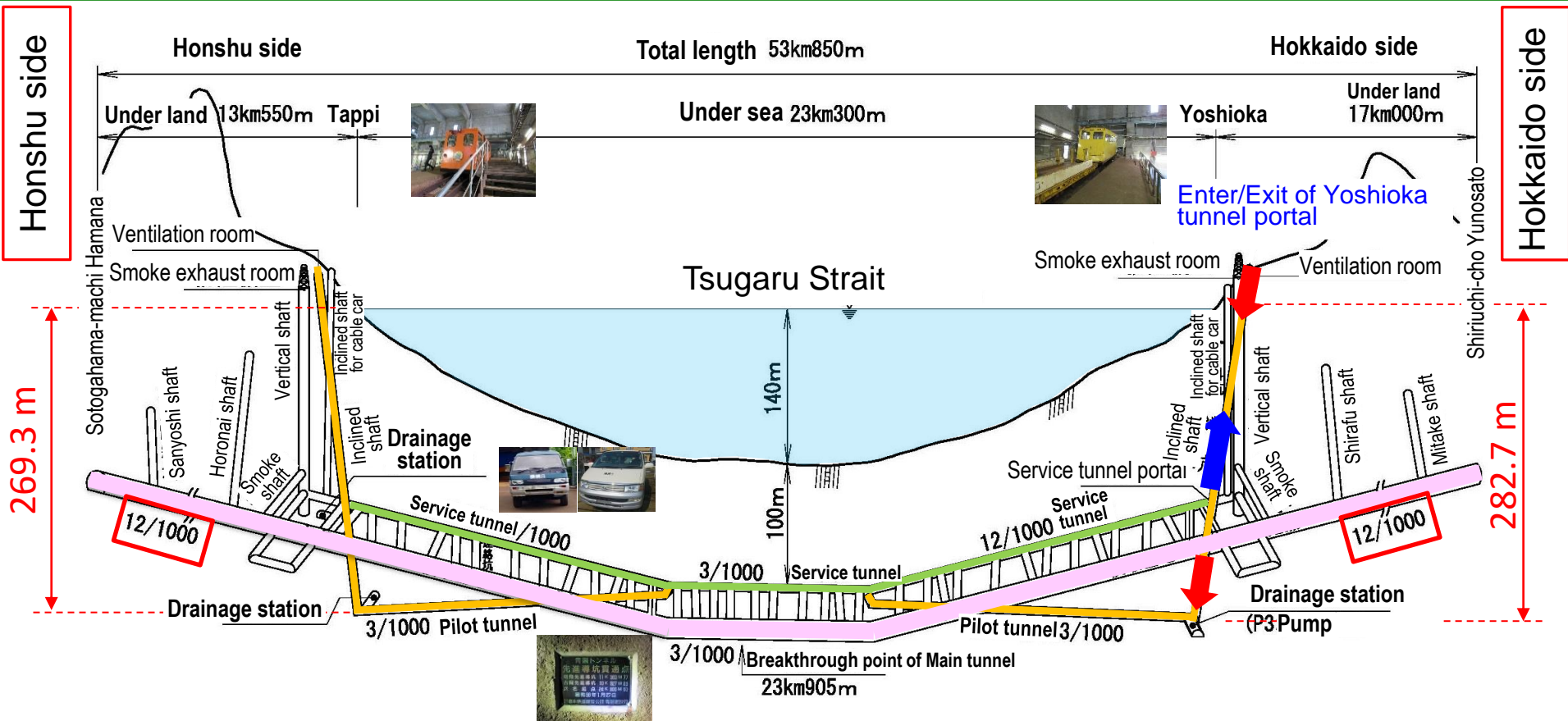


* Source: Front page of Asahi evening paper on September 27, 1954



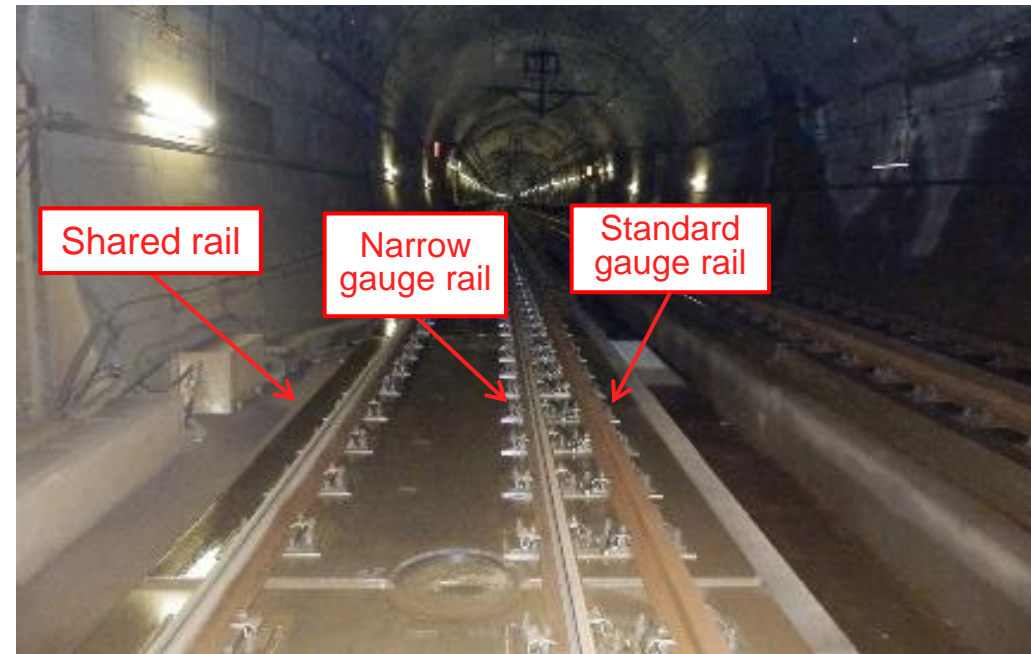
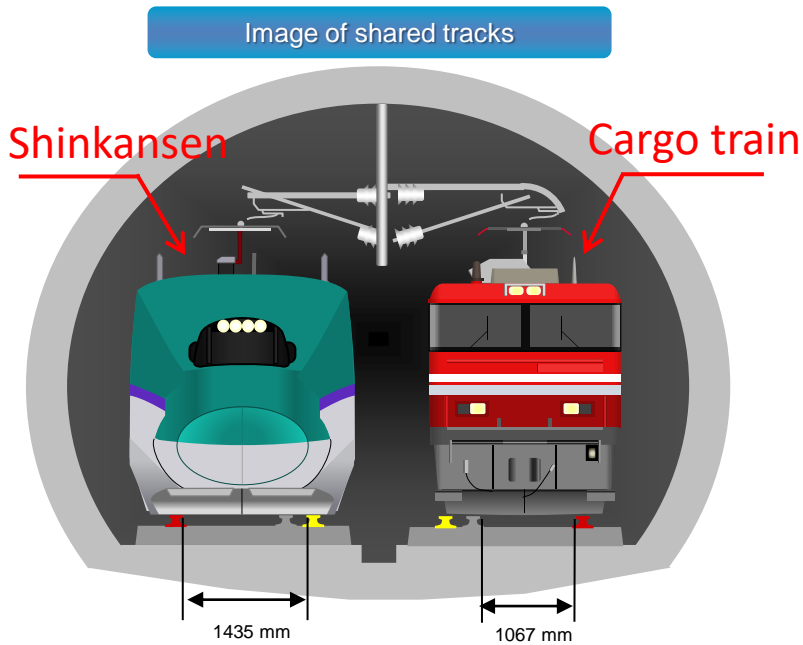
JRTT started the construction in 1964 and it took 24 years to open in 1988.

Shinkansen and Cargo Train: Longitudinal Section of Seikan Tunnel



- Length of Shafts of Seikan Tunnel
- Main tunnel: 53.850 km (Under sea: 23.30 km)
- Service tunnel: 23.114 km
- Pilot tunnel: 17.123 km (Tappi side: 8.604 km Yoshioka side 8.519 km)
- Inclined shaft: 2.525 km (Tappi side: 1.315 km, Yoshioka side: 1.210 km)
- Total length: 96.612 km

Shinkansen and Cargo Train: Reformation of Seikan Tunnel



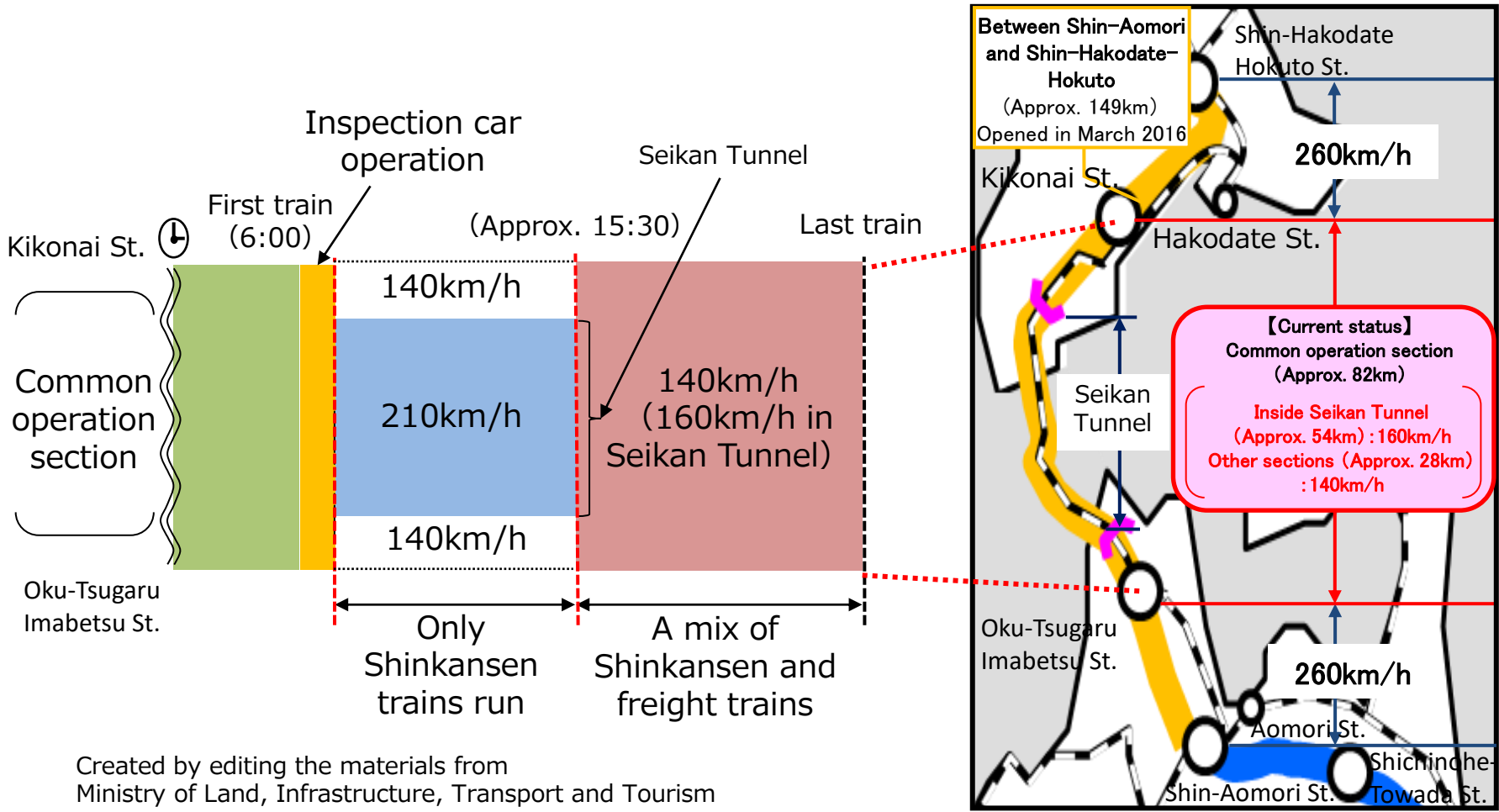
Train traveling speed in Seikan Tunnel

- Cargo train: 100 km/h
- Shinkansen: 160 km/h

210 km/h is available in the period of fewer cargo operation

Shinkansen and Cargo Train: Time Allocation

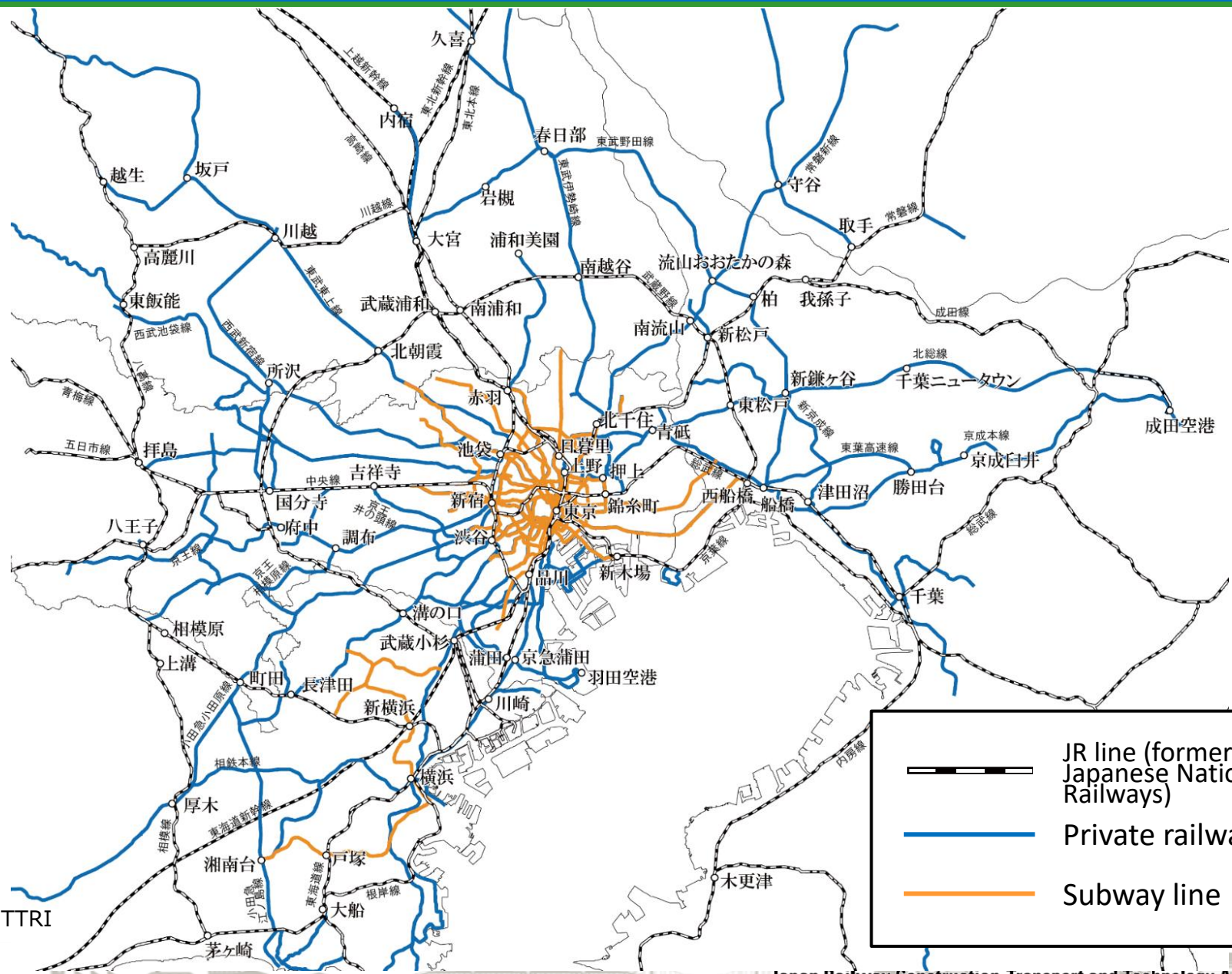
- This system enables Shinkansen to run at a high speed by separating operation time between cargo trains and Shinkansen trains
- The high-speed travel time is assigned only to Shinkansen to run at 210 km/h in Seikan Tunnel
- The system works in specific periods when few cargo trains run such as new-year holidays



Created by editing the materials from Ministry of Land, Infrastructure, Transport and Tourism

1. **History of Railway Development in Japan — p.3 - p.6**
2. **High-Speed Railway (Shinkansen Lines) — p.7 - p.39**
 - (1) **Present Situation of Shinkansen Lines — p.7 - p.16**
 - (2) **Characteristics of Shinkansen Lines — p.17 - p.23**
 - (3) **Construction Scheme of Shinkansen Lines — p.24 - p.26**
 - (4) **Benefits of Shinkansen Lines — p.27 - p.29**
 - (5) **Reference Information for Vietnam — p.30 - p.39**
3. **Urban Railways — p.40 - p.52**
4. **Sustainable State of Railways — p.53 - p.61**
5. **Closing — p.62 - p.64**

Urban Railways ①: Urban Railways of Tokyo Metropolitan Area



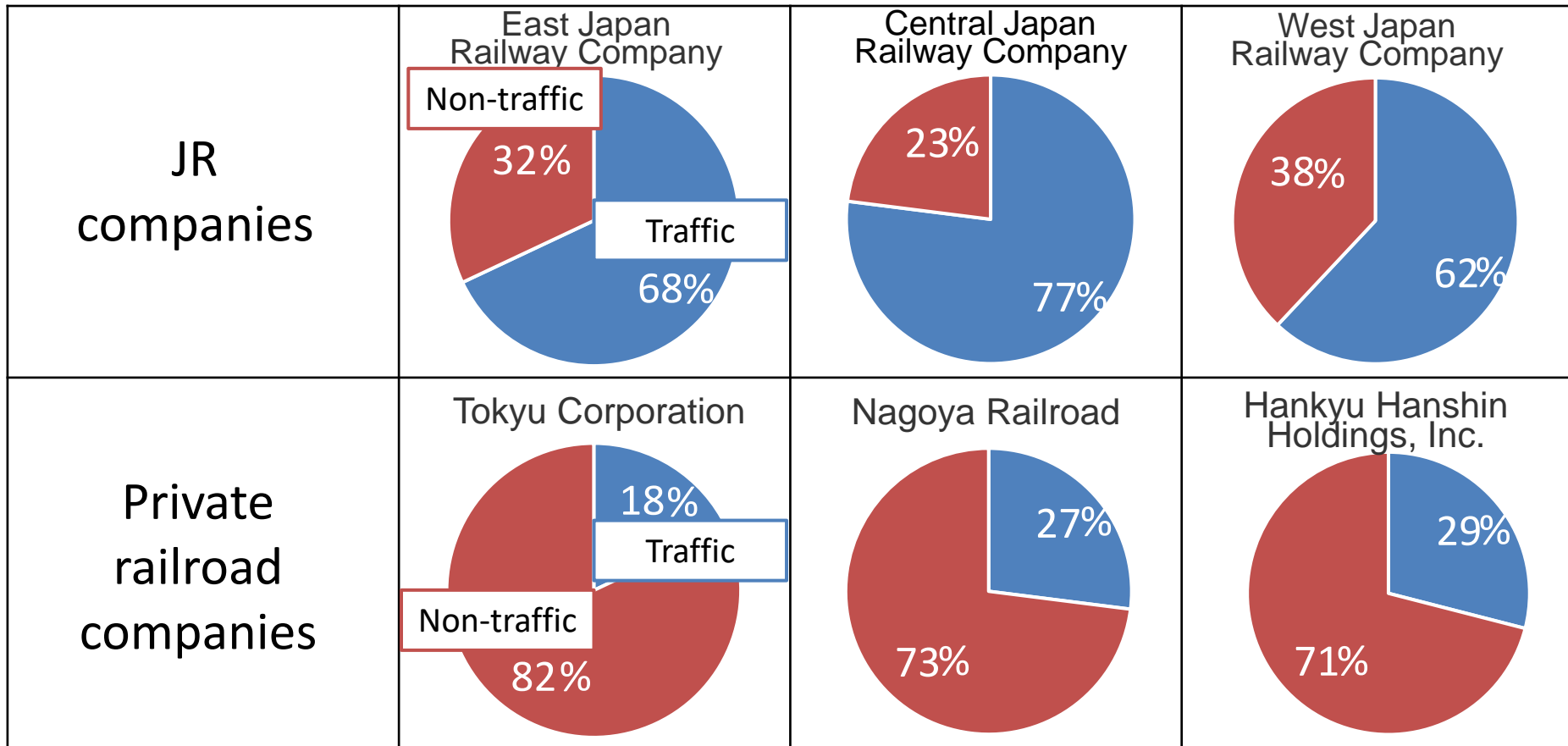
	JR line (former Japanese National Railways)
	Private railway
	Subway line

Source: JTTRI

Urban Railways ②: Characteristics of Income Structure of Railroad Companies

- For 3 JR companies in Honshu, approximately two-thirds of revenue comes from the traffic.
- In major private railroad companies, non-traffic business accounts for over 70% of their income, providing the development of various businesses.

Proportion of traffic and non-traffic



Source: Financial results for the fiscal year ending March 2019, etc. of each company

(Note) The segmental ratios were calculated by the Railway Bureau from published official data on a consolidated basis.

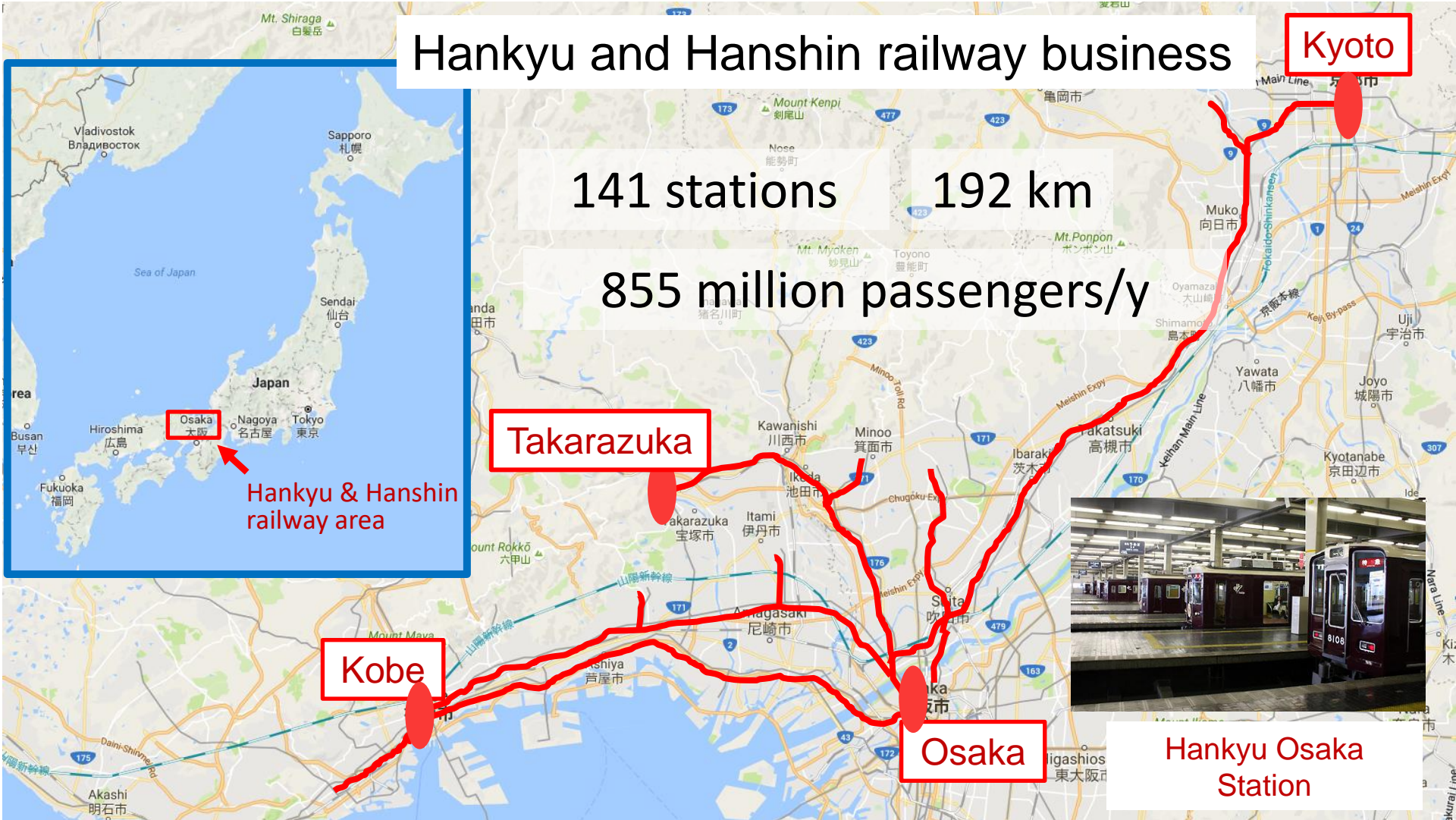
Urban Private Railways ③: Case of Hankyu and Hanshin

Hankyu and Hanshin railway business

141 stations

192 km

855 million passengers/y

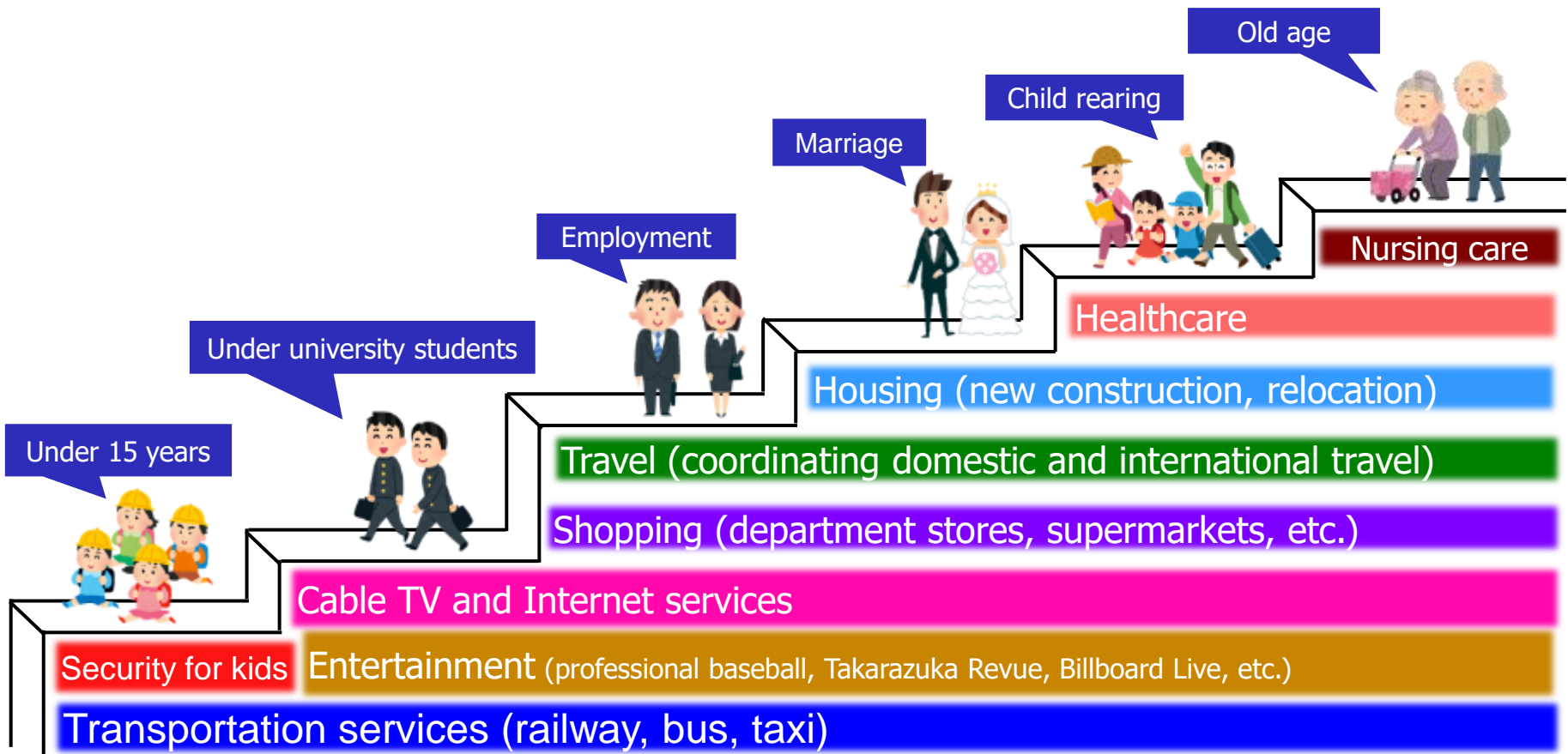


Hankyu Osaka Station

Source: Hankyu Hanshin Holdings, Inc.

Urban Private Railways ④: Case of Hankyu and Hanshin

In Japan, many privately-owned urban railway companies have been operating with 100% private capital since their establishment. They develop cities along their lines and provide services that support the lives of their customers throughout their lives.



Source: Hankyu Hanshin Holdings, Inc.

Urban Private Railways ⑤: Case of Hankyu and Hanshin

In 2023, the Hanshin Tigers, owned by Hanshin Electric Railway, became the champion of Japanese professional baseball.



Source: Hankyu Hanshin Holdings, Inc.



TOD (Transit Oriented Development) = Public Transportation - Oriented Development

Urban development which aims to promote public transit, not to increase automobile dependency

Method	Details	Example
Tax on land or fixed assets	Tax revenue increase due to a rise in the value of land with railway development (Post burden based on results)	<ul style="list-style-type: none"> ▪ Estate tax ▪ Urban planning tax ▪ Real estate acquisition tax
Beneficiary liability	Burdens for expected benefits from railway development (Advance burden on assumptions)	<ul style="list-style-type: none"> ▪ Midosuji Line ▪ Yokohama MM21 ▪ Business Rate Supplement (England) ▪ Development costs imposition (Canada) ▪ Impact fee (U.S.)
Land readjustment	Reorganize lands of multiple owners to provide spaces for railway construction	<ul style="list-style-type: none"> ▪ Tokyu Den-En-Toshi Line ▪ Tsukuba Express Line

Minatomirai Line construction financing methods including beneficiary liability (City of Yokohama)

A part of railway business costs are collected from large-scale landowners (beneficiaries) as burden charge

Outline of Minatomirai (MM21) area redevelopment

- Redevelopment of old shipyards, cargo yards, etc. ➡ Development of offices, hotels, parks, and amusement facilities
- Development area: 186 ha (of which, reclaimed land: 76 ha)

Outline of Minatomirai Line

- Construction started in 1992 and commercial service in 2004
- Publicly owned / privately operated (operated by Tokyu Corporation)
- 4.1 km, 6 stations (all underground)

Details of operating costs
(source: City of Yokohama)

Capital fund (local governments, etc.)	27 billion yen
Beneficiary	74 billion yen
JRTT	129 billion yen
Borrowings, etc.	27 billion yen
Total	257 billion yen

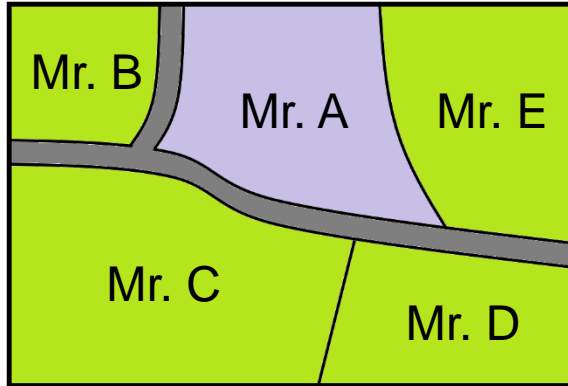
Beneficiaries:
MITSUBISHI ESTATE, Mitsubishi Heavy Industries, Yokohama City, Urban Renaissance Agency, etc.



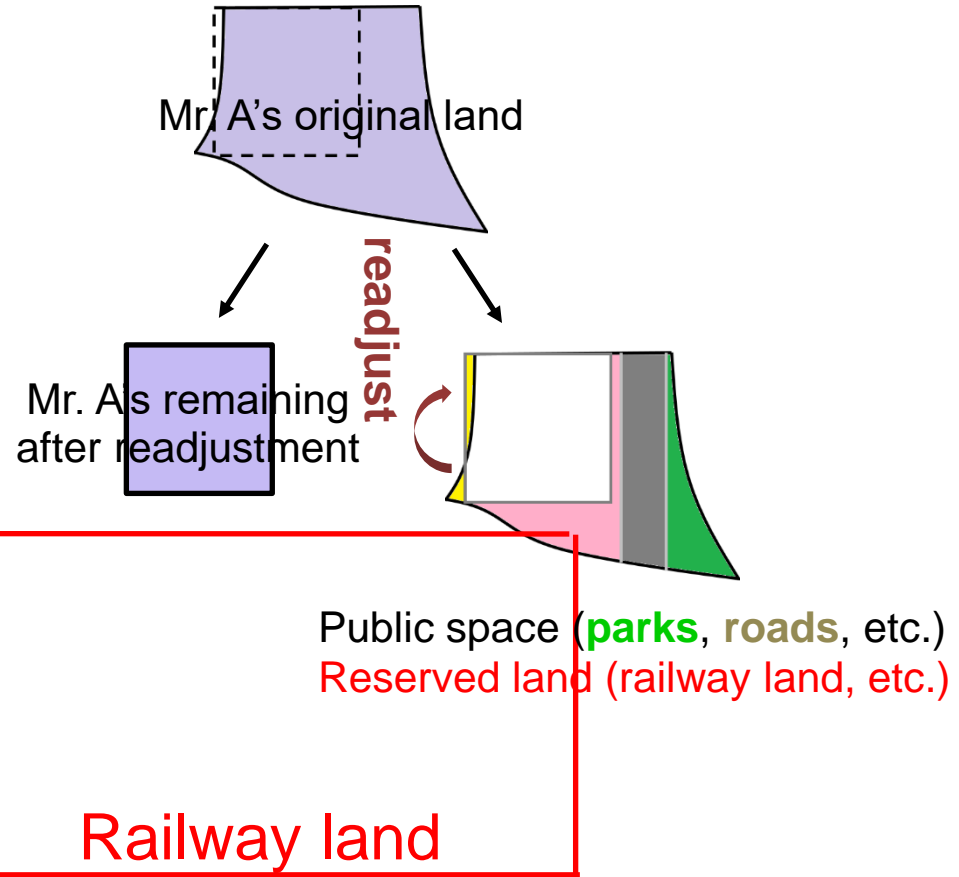
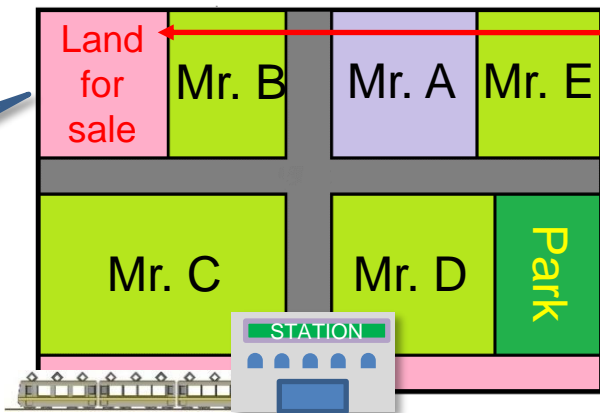
Minatomirai Line website https://www.mm21railway.co.jp/info/route_map.html

Urban Railway Development Method ③: Land Readjustment Project

Before



After

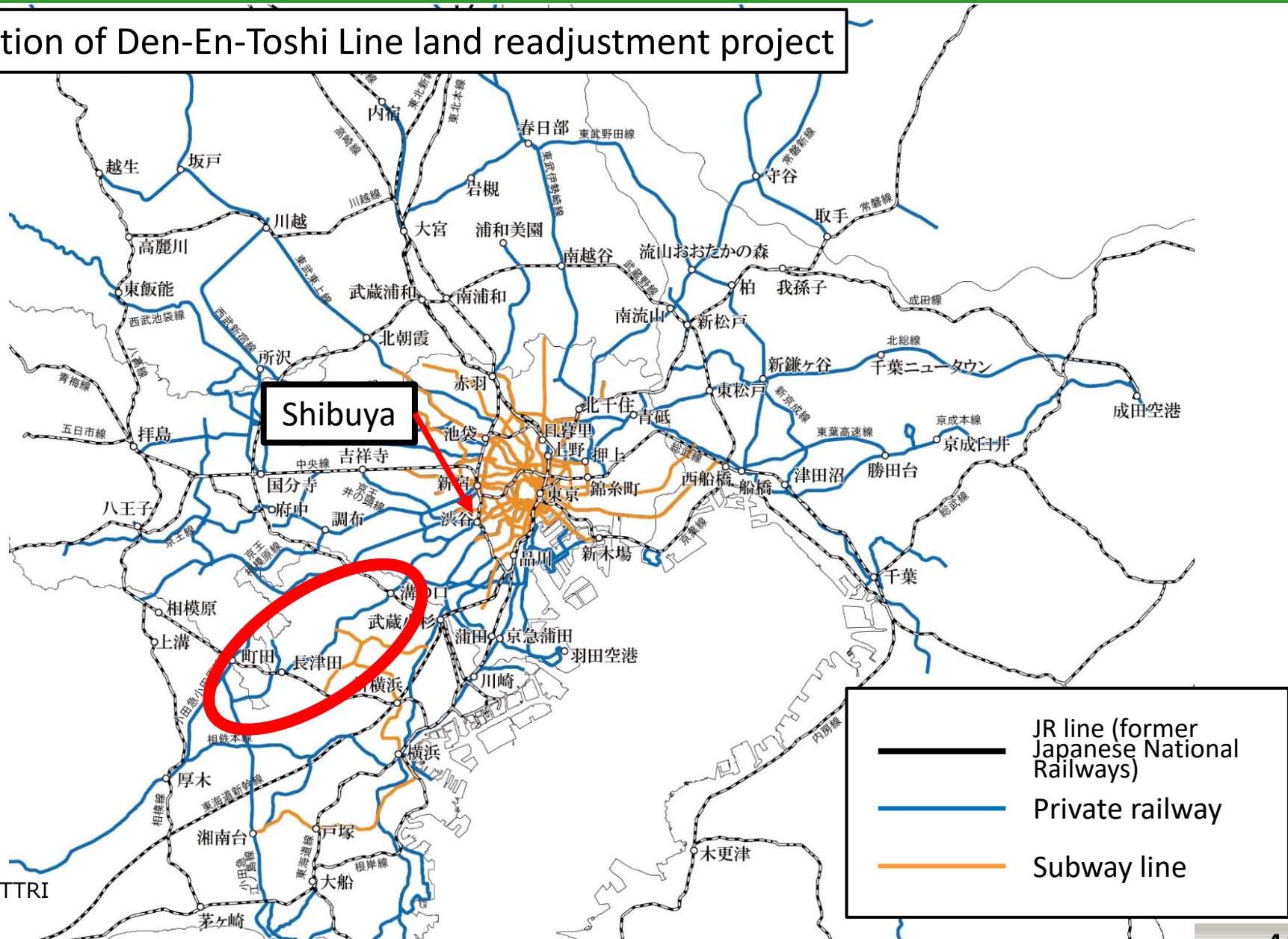


Although the amount of land decreases after the readjustment, **landowners have no loss** because their land value will rise from **better accessibility**.

Created by JTTRI based on the materials of MLIT

Urban Railway Development Method ④: Development of Areas Along Tokyu Den-En-Toshi Line

Location of Den-En-Toshi Line land readjustment project



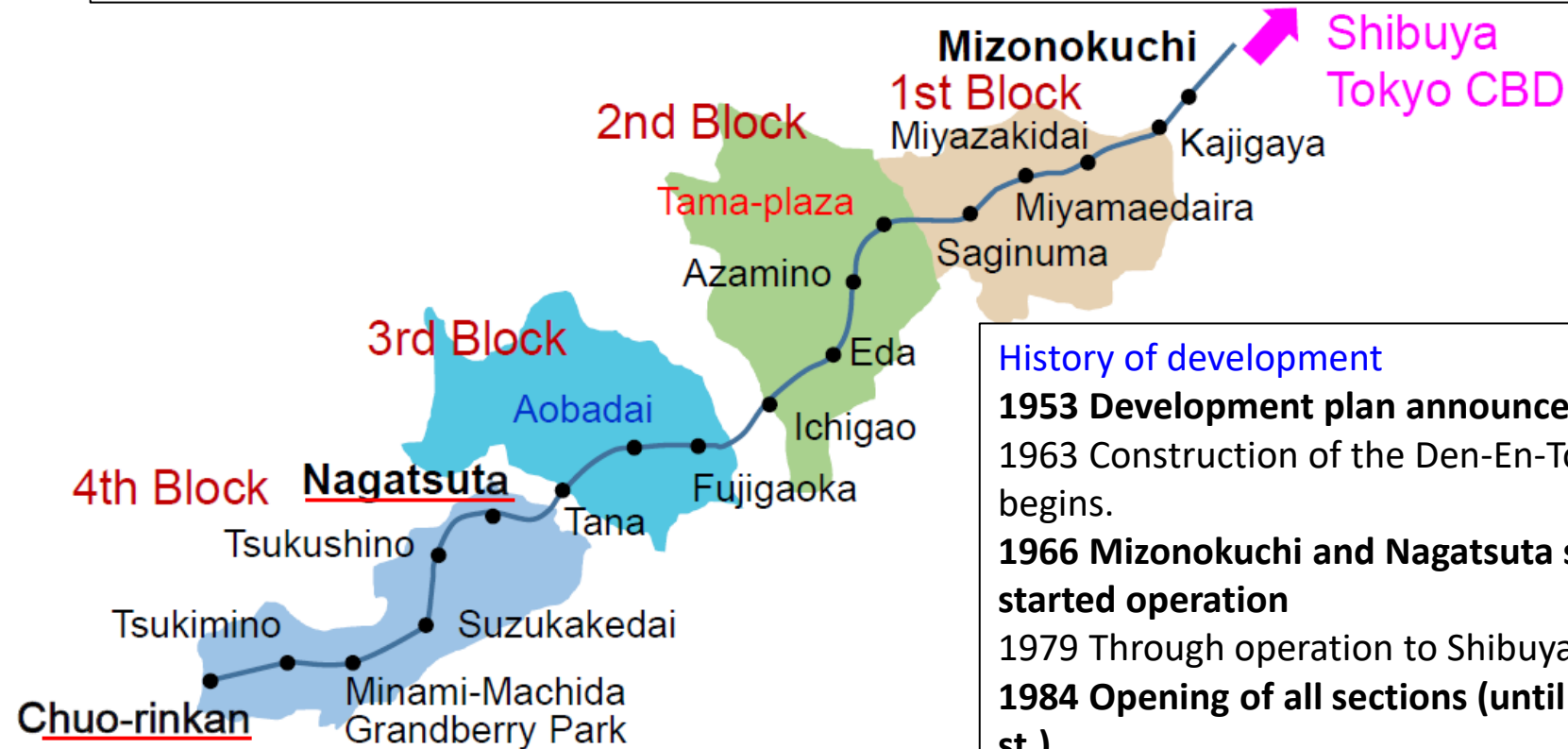
Source: JTTRI

Urban Railway Development Method ⑤: Development of Areas Along Tokyu Den-En-Toshi Line

TOD along Den-En-Toshi (Garden City) Line:

Integrated railway (Den-En-Toshi Line) and land development (with land readjustment program), taken by only one developer, Tokyu Railway.

- Total area ~ 5,000ha, Population ~ 620,000 (March 2017)
- The largest private land development project in Japan



History of development

1953 Development plan announced

1963 Construction of the Den-En-Toshi Line begins.

1966 Mizonokuchi and Nagatsuta section started operation

1979 Through operation to Shibuya

1984 Opening of all sections (until Chuo-rinkan st.)

2006 Completion of land readjustment program

Created by editing the materials (JTTRI)

https://www.tokyu.co.jp/company/business/urban_development/denentoshi/

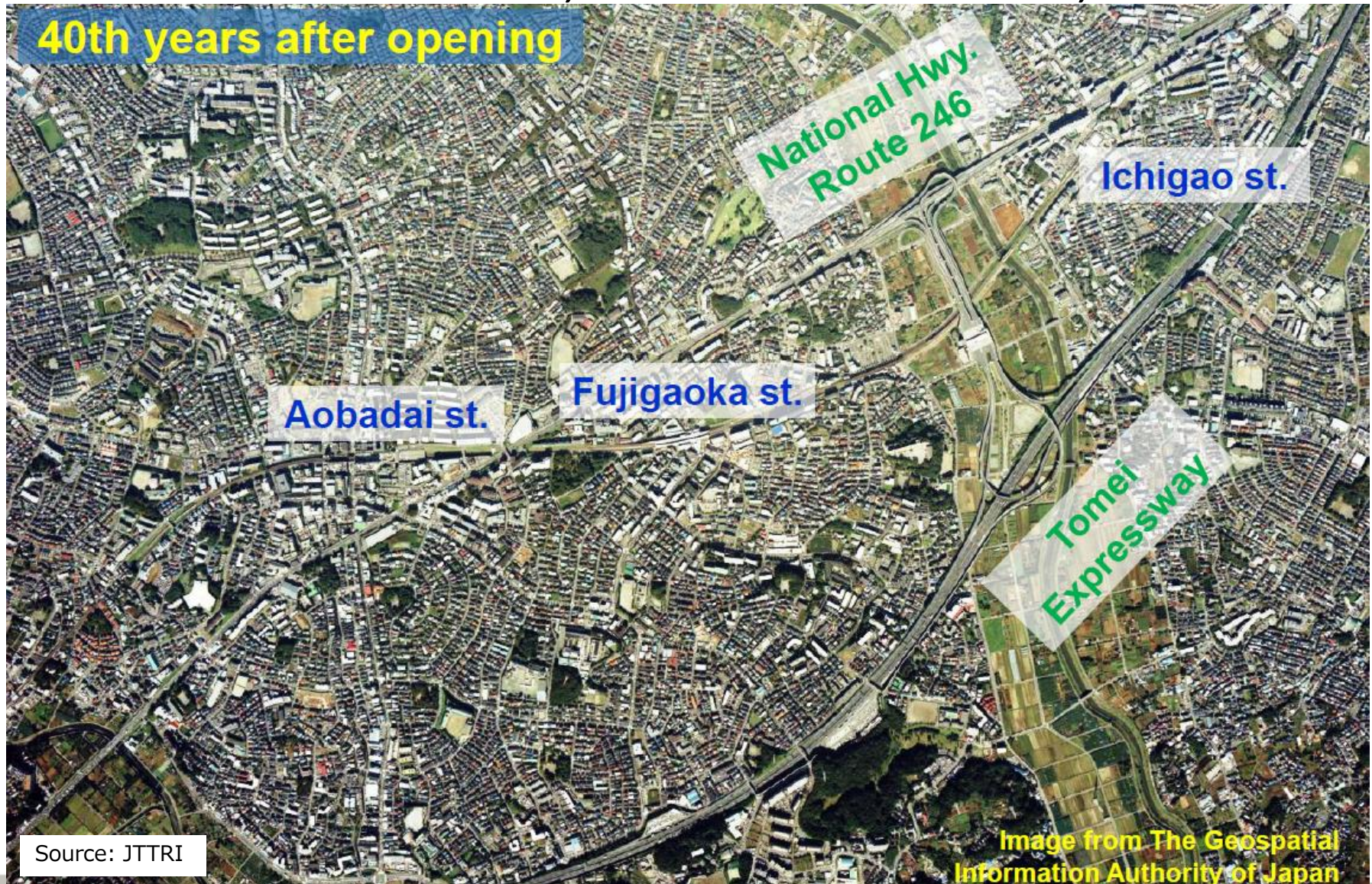
<https://www.tokyu-cnst.co.jp/company/brandmessage.html>

Den-En-Toshi Line, near Aobadai Station, 1965



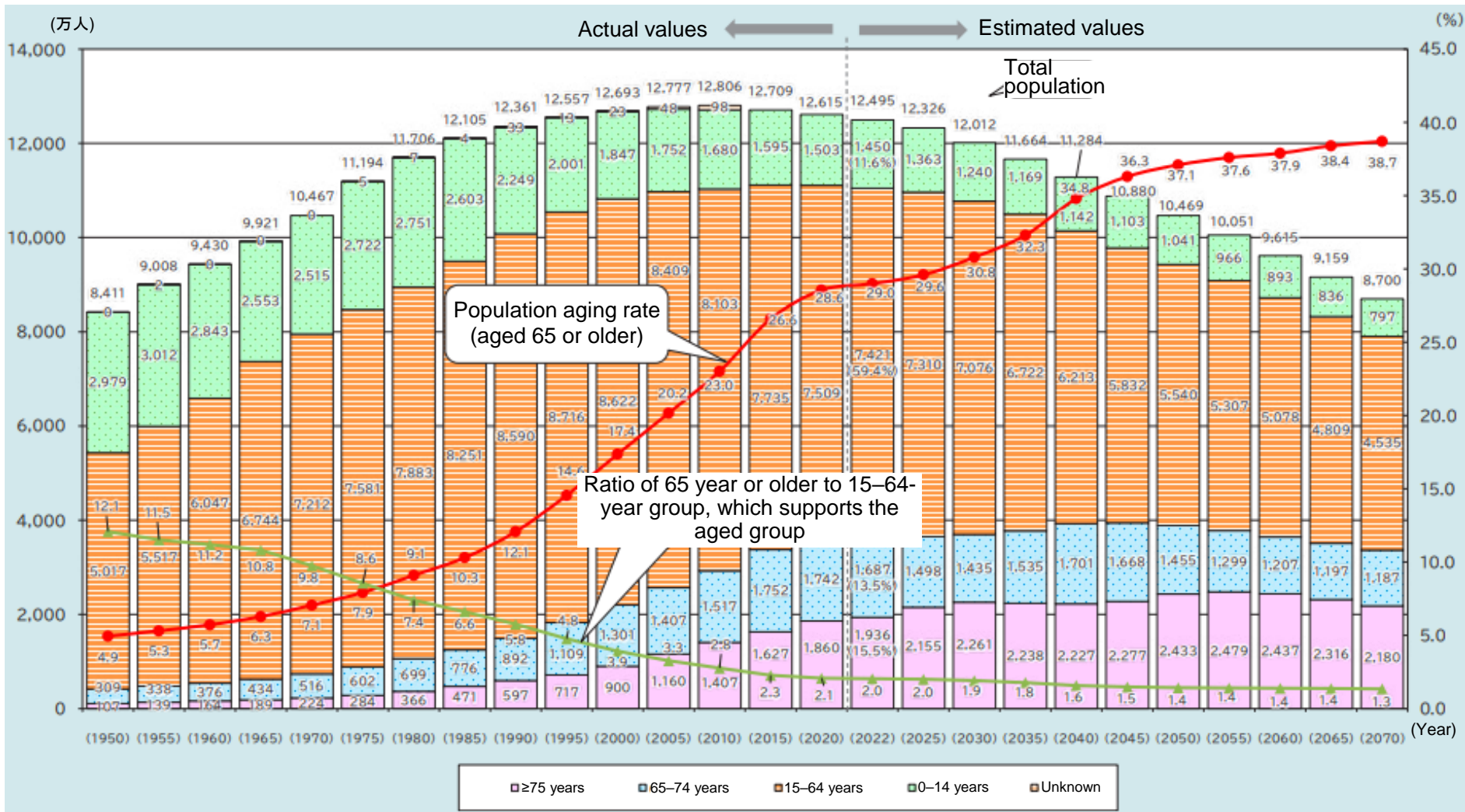
Source: JTTRI

Den-En-Toshi Line, near Aobadai Station, 2005



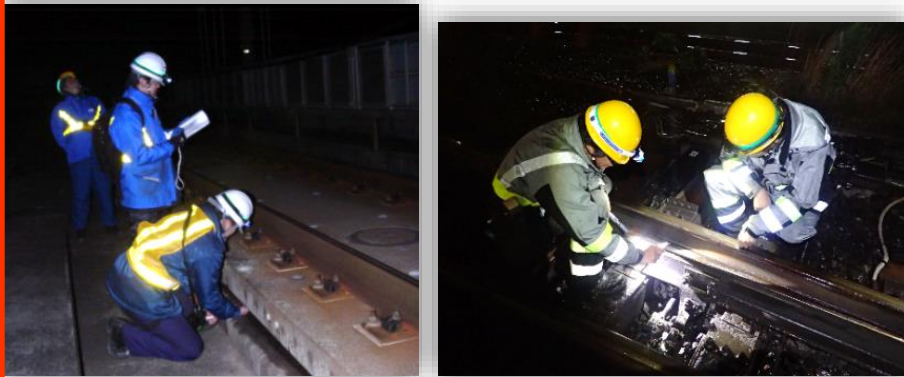
1. **History of Railway Development in Japan — p.3 - p.6**
2. **High-Speed Railway (Shinkansen Lines) — p.7 - p.39**
 - (1) **Present Situation of Shinkansen Lines — p.7 - p.16**
 - (2) **Characteristics of Shinkansen Lines — p.17 - p.23**
 - (3) **Construction Scheme of Shinkansen Lines — p.24 - p.26**
 - (4) **Benefits of Shinkansen Lines — p.27 - p.29**
 - (5) **Reference Information for Vietnam — p.30 - p.39**
3. **Urban Railways — p.40 - p.52**
4. **Sustainable State of Railways — p.53 - p.61**
5. **Closing — p.62 - p.64**

Sustainability ①: Population Trends of Japan



* Source: Cabinet Office "Annual Report on the Ageing Society 2023"

Conventional inspection method



Male walk along the site at night

- During the limited time after the last train,
- Secure the necessary personnel for inspection (e.g., inspector, scorer, lookout),
- Inspect the track while considering safety measures against freight train, etc. even after the last passenger train

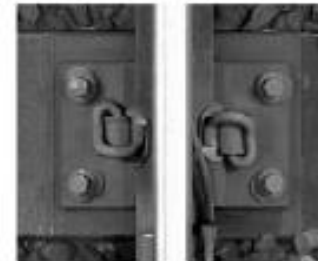
Source: Ministry of Land, Infrastructure, Transport and Tourism

Railway facility monitor (track material inspection)

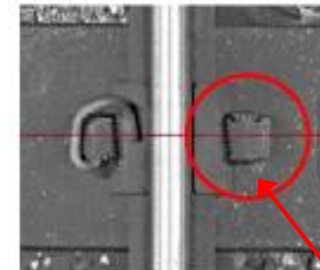


Image data

[Rail fastener]



Normal condition



Automatically detects defects

Dislocation of fastening device

[Rail joint plate fastening bolt]



Normal condition



Automatically detects defects

Dislocation of rail joint plate fastening bolt

Sustainability ③: New Technology Application to Track Maintenance

Currently

- During the limited time after the last train,
- Secure the necessary personnel for inspection (e.g., inspector, scorer, lookout),
- Inspect the track while considering safety measures against freight train, etc. even after the last passenger train

Male walk along the site at night



A new initiative has begun

About 10 Female check data of track material for approx. 6,500 km line extension **on computer screens in the office during daytime**



Data transmission



Sustainability ④: Consideration of Automated Driving Technology Without a Driver on Railway

Background

- It is increasingly difficult to secure and educate drivers or maintenance operators. Especially, the lack of staff members is a serious problem in local railway companies.

Current status of automated cruise

[Automated operation system of new transportation, etc.]

- Elevated tracks
- Without level crossing
- Platform screen doors



[General lines with level crossings, etc.]

- No cases because the routes were constructed based on crew's driving.
- Especially, in local railways, a large investment in automated driving operations is difficult.



Elevated structure



Platform doors



On land
(non-elevated structure)



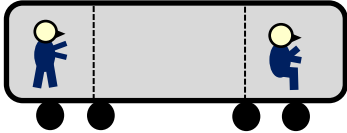
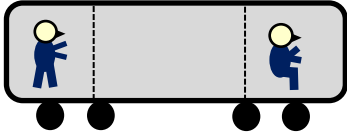

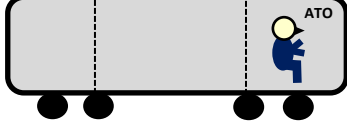
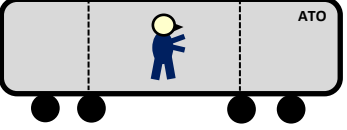

Level crossing



Platform without
platform doors

Created by editing the materials
(Ministry of Land, Infrastructure, Transport and Tourism)

Sustainability ⑤: Classification by Modes of Train Operation (Grade of Automation)

Grade of automation (Definition according to IEC (JIS)*)	Image of modes of train operation (Main tasks of crews are referred in [])	Implementation state of Japan
GOA0 On Sight Train Operation (TOS)	 Driver (and conductor)	Streetcar
GOA1 Non-automated Train Operation (NTO)	 Driver (and conductor)	General train lines with railroad crossings, etc.
GOA2 Semi-automated Train Operation (STO)	 Driver [starting a train, operating emergency brakes, evacuation guidance, etc.]	Some subway lines, etc.
GOA2.5 (Automated operation with a conductor for emergency brakes, etc.) ⇒Not defined in IEC and JIS	 Conductor deployed in the front car of the train [operating emergency brakes, evacuation guidance, etc.]	No cases
GOA3 Driverless Train Operation (DTO)	 Conductor on board [evacuation guidance, etc.]	Some monorail
GOA4 Unattended Train Operation (UTO)	 No conductors on board	New transportation systems

* IEC 62267 (JIS E 3802): Defined in Automated Urban Guided Transport
 (IEC: International Electrotechnical Commission; an organization that develops international standards for all electrical, electronic and related technologies)
 Source: Ministry of Land, Infrastructure, Transport and Tourism
GOA: Grade Of Automation
TOS: On Sight Train Operation; **NTO**: Non-automated Train Operation; **STO**: Semi-automated Train Operation;
DTO: Driverless Train Operation; **UTO**: Unattended Train Operation

Current status: GOA1 or 2

Train operation by a driver



- * A driver operates the master controller handle (corresponds to the accelerator) by his left hand, and the brake handle by his right hand.

GOA2.5

Automatic operation
with a conductor

Train operation by staff without a driver's license is now possible, making operation more efficient and labor-saving.



- * An operator only places his left hand on the emergency stop button.
- * Scheduled to start in March next year on the JR Kyushu Kashii Line

Created by editing the materials
(Ministry of Land, Infrastructure, Transport and Tourism)

1. **History of Railway Development in Japan — p.3 - p.6**
2. **High-Speed Railway (Shinkansen Lines) — p.7 - p.39**
 - (1) **Present Situation of Shinkansen Lines — p.7 - p.16**
 - (2) **Characteristics of Shinkansen Lines — p.17 - p.23**
 - (3) **Construction Scheme of Shinkansen Lines — p.24 - p.26**
 - (4) **Benefits of Shinkansen Lines — p.27 - p.29**
 - (5) **Reference Information for Vietnam — p.30 - p.39**
3. **Urban Railways — p.40 - p.52**
4. **Sustainable State of Railways — p.53 - p.61**
5. **Closing — p.62 - p.64**

Taiwan HSR



Survey for Sweden



Indian HSR



I hope that the relationship between Vietnam and JRTT will be deepened even more!



Tôi xin cảm ơn mọi người.