Bridging the gap

Pathways for Transport in the Post 2012 Process

The contribution of High Speed Rail to Climate Change

Institution for Transport Policy Studies

Japan International Transport Institute

Hiroyuki TAKESHITA

Transport and Climate Change Expert Day, Doha
29.11.2012

Institution for Transport Policy Studies(ITPS)

- Established in 1969
- Non-profit research institute
- General funding from The **Nippon Foundation**
- More than 60 transportation experts
- Japan International Transport Institute(JITI), which is one of the institutes of ITPS, is conducting research on international transport issues

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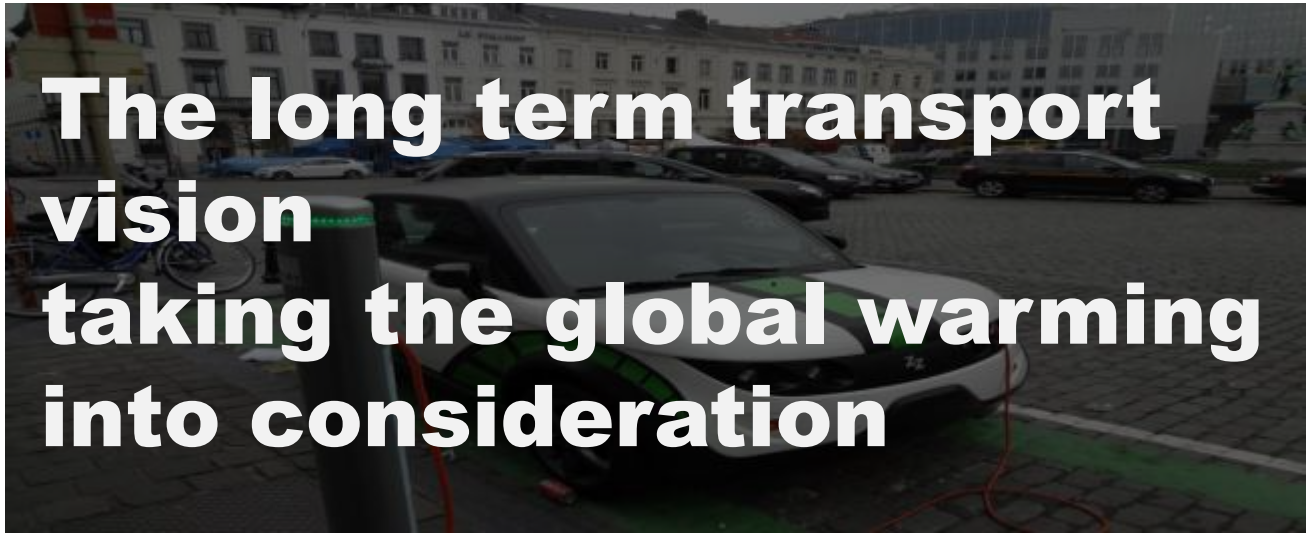
Today's Topics

1



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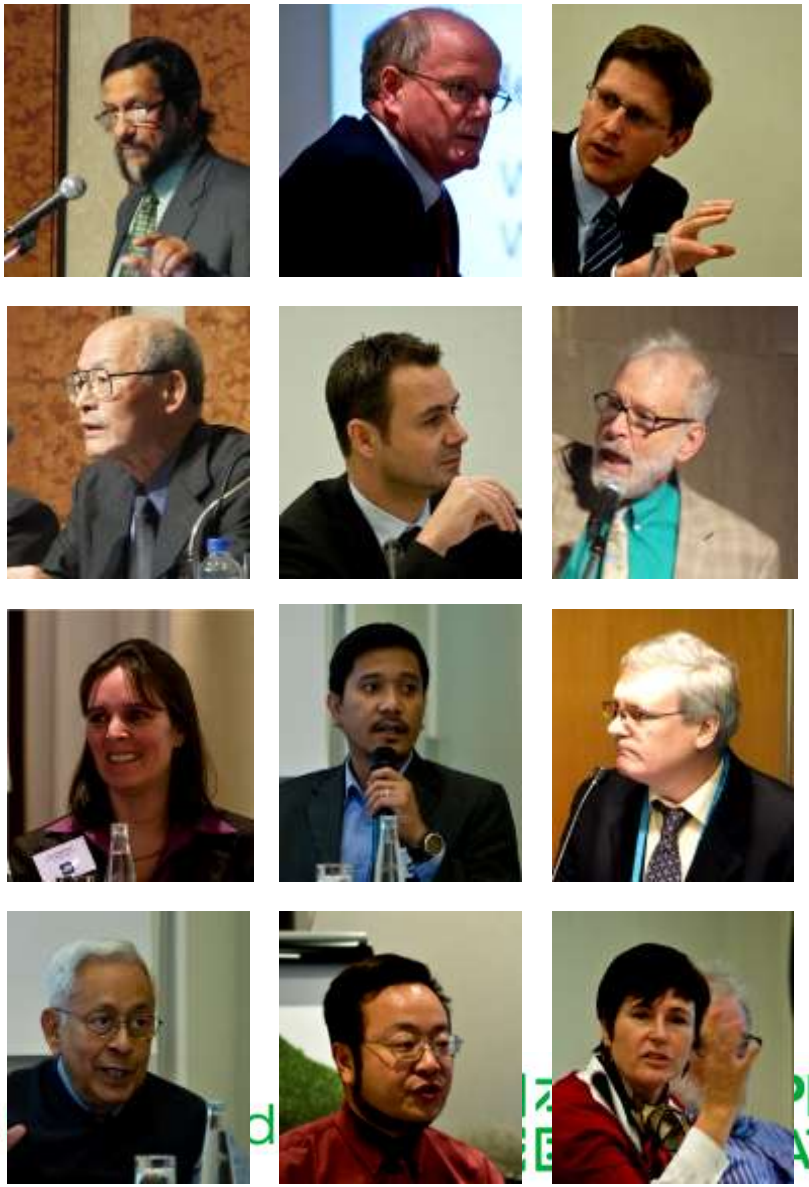
STL

Study of Transport System in a Low Carbon Society
April 2008 – March 2011



1. **Base/Target year**
   2000/2050
2. **Target material**
   CO2 from transport
3. **Reduction Target**
   50% compared with 2000
4. **Target Region**
   Global, America, Europe, China, India, SE-Asia (80% of CO2 emission in transport sector)

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What we found in STL

1. Not only Technologies

but also drastic modal shift or behavior change are required

2. Long-term Strategies

are required for achieving the goal

ITPS is conducting Long Term Transport Action Plan for ASEAN

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5 Common Policies

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Why High Speed Rail?

- Considerable volume of inter urban transport
  - Non urban non OECD volume (including Inter urban transport) will increase remarkably
- Long introduction time
  - A HSR **'line'** introduction takes at least a few years
  - However, HSR **'network'** establishment takes several decades

Now is the right time to make a long term investment plan for HSR in the emerging countries!

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How much is the possibility of introducing HSR in emerging countries?

Develop the criteria and methodology for evaluating adequacy of HSR introduction

Application in India for visioning future HSR network as a case study

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France **TGV**

Germany **ICE**

Spain **AVE**

Korea **KTX**

Turkey **HT65000**

China **Hexie Hao**

Real GDP per capita (PPP)

in construction starting year

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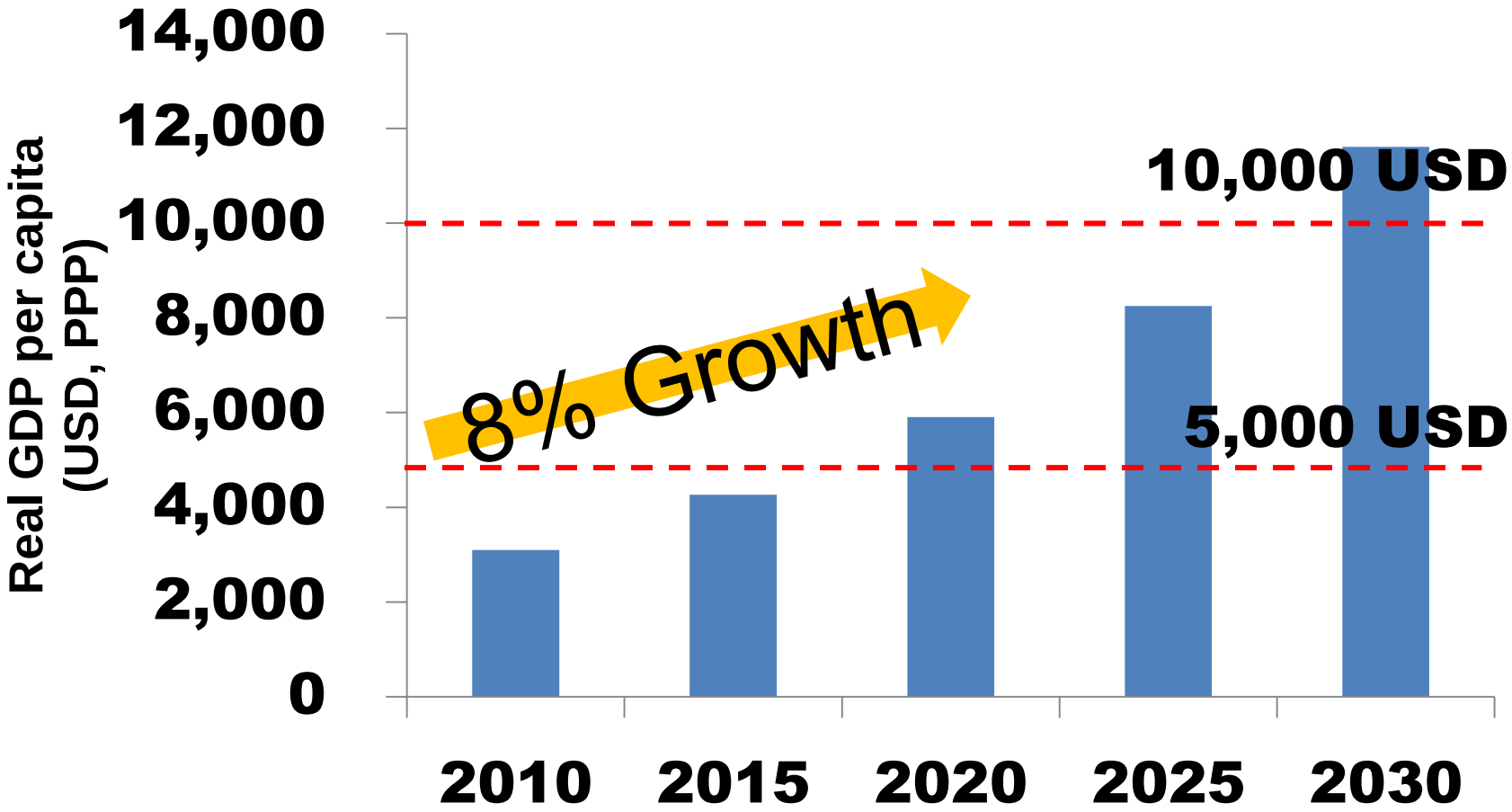
Indian Economic Prospects



Reference : TERI

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Population of India

- Population
  - 1.2 Billion (Census 2011)
  - Population will continue to increase
    - Population of India will exceed China in 2020
- Population Density
  - 366.7/km^2
    - Higher than Japan (337/km^2)
    - It is appropriate to introduce mass transport system like railway
- In addition, million plus cities will increase due to "rapid urbanization"

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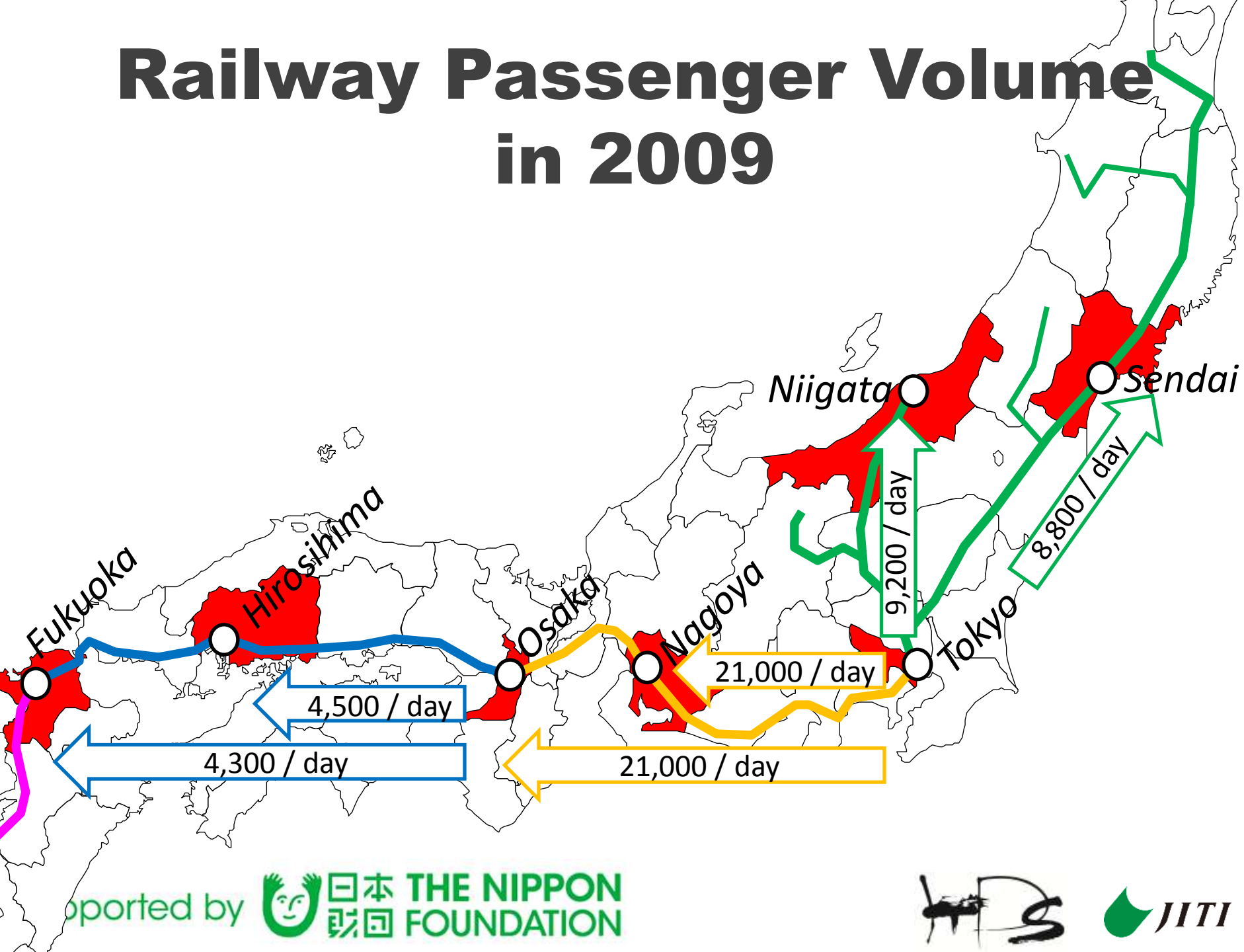
Passenger Volume

- Today's passenger volume of Tokaido Shinkansen: 378,000/day
  - However, passenger volume before or right after Shinkansen introduction was less than today
    - Before Shinkansen: Less Express train service compare to Shinkansen service
    - Right after Shinkansen: 85,000/day in 1965

Railway Passenger Volume in 2009



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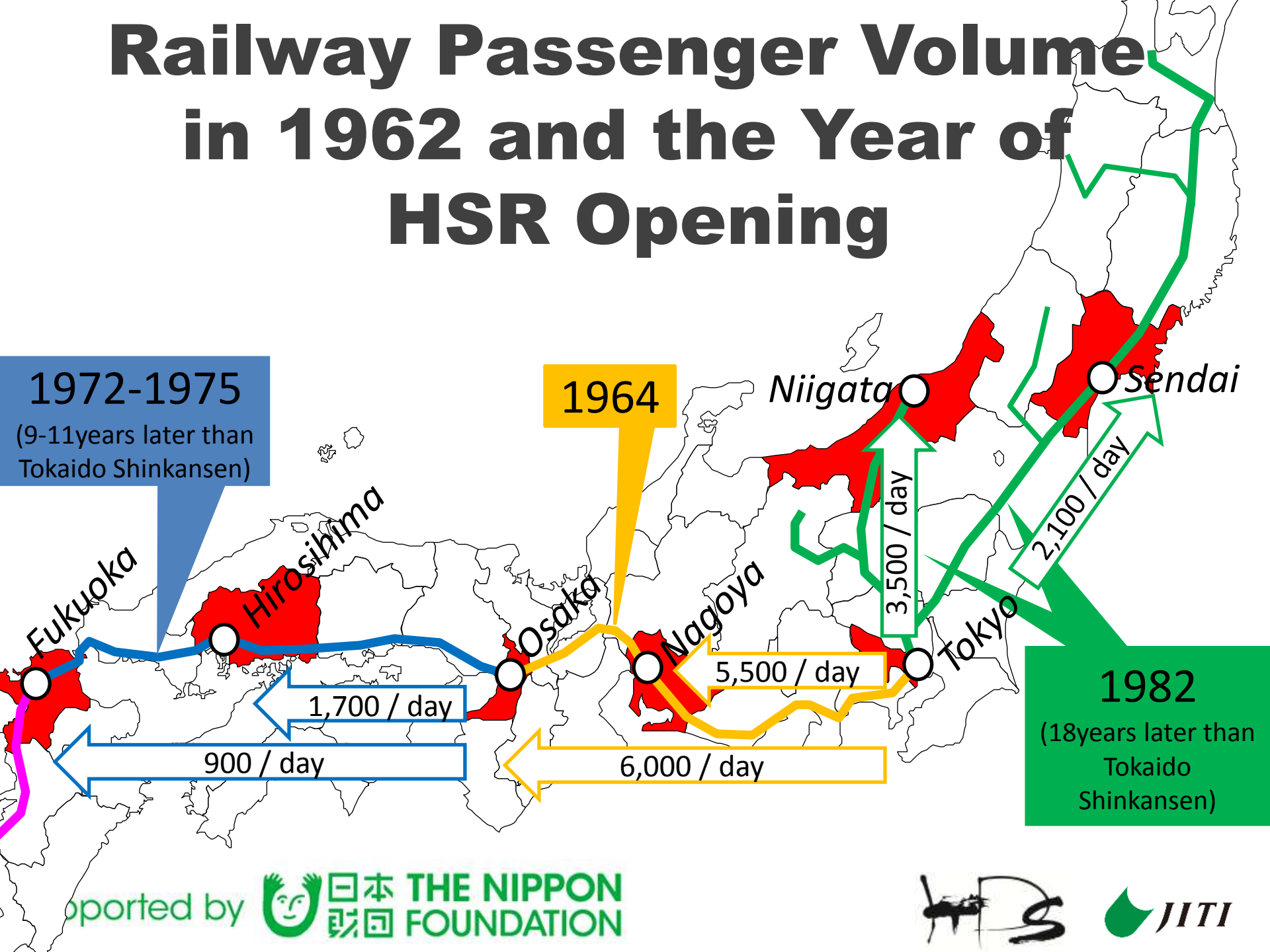
Railway Passenger Volume in 1962 and the Year of HSR Opening



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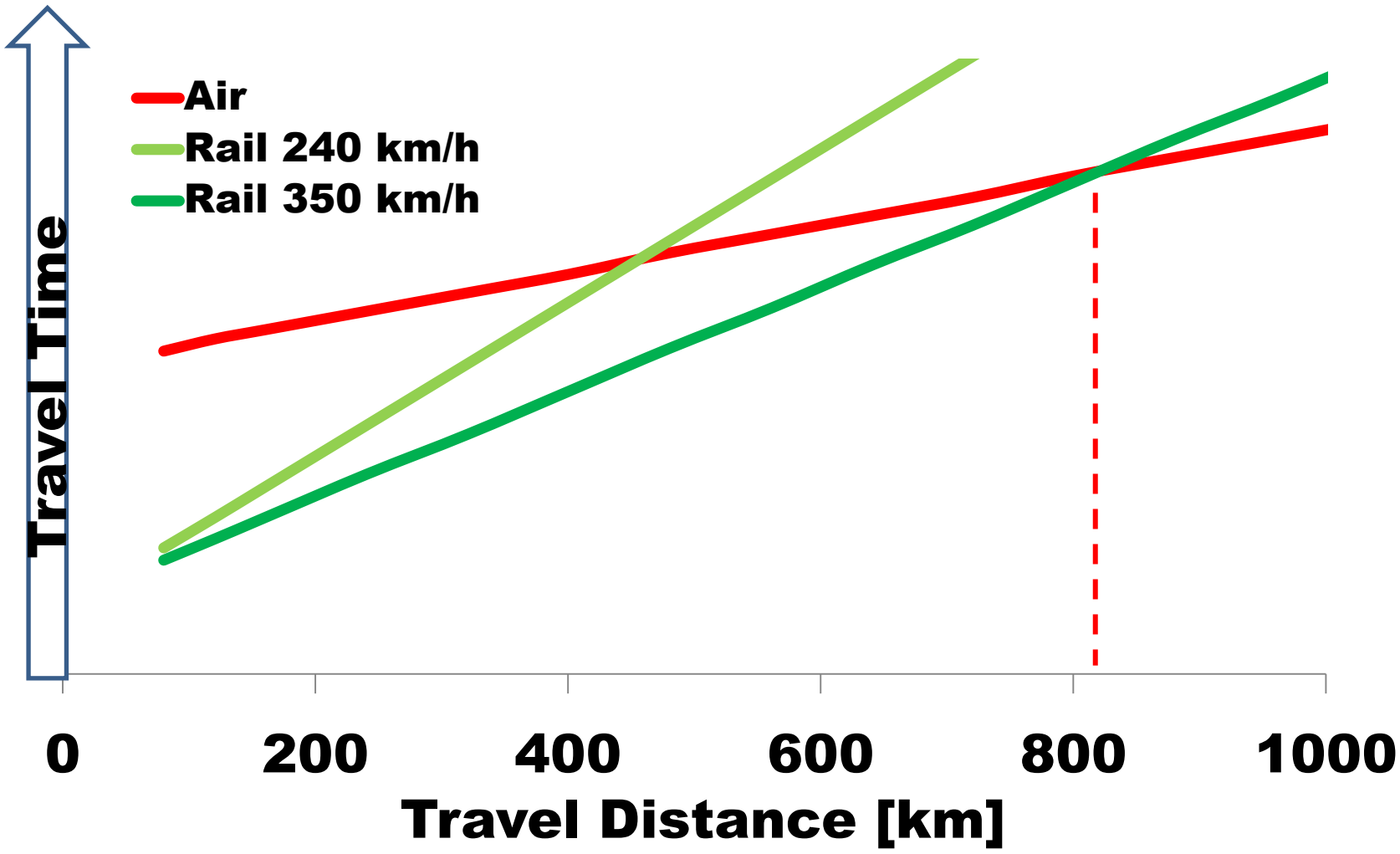
Corridor distance



Methodology for HSR candidate corridor selection

- Select the suitable corridor by the criteria below
  - Distance: Under 1,000 km
  - There are over 500,000 cities along the corridor
  - Rail traffic volume: Over 2,000 passengers/day in 2015 (the year when GDP per capita will be over 4,000 USD)
  - Volume of other transport mode (Aviation and Bus service)

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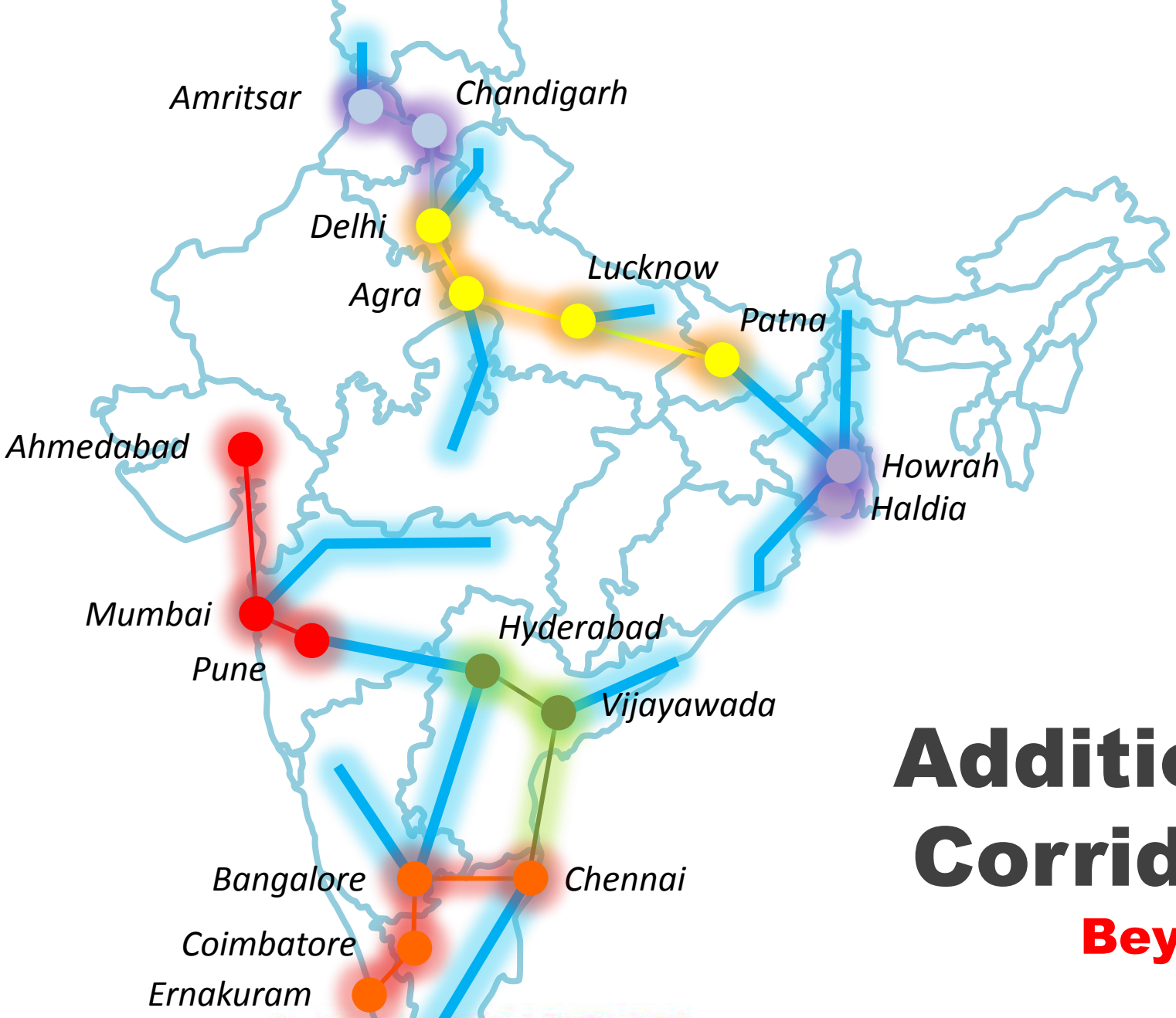

Additional Corridors

Beyond 2020

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P O I N T S

When we think of a long term transport vision, HSR is indispensable in many emerging countries

There are many countries and corridors where the development of HSR is possible and suitable

It is important to deepen the understanding of benefits brought by HSR and raise the priority of the project.

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Thank you

for your patience

Hiroyuki TAKESHITA

takeshita@jterc.or.jp

Institution for Transport Policy Studies, Japan

3-18-19 Toranomon, Minato-ku, Tokyo 105-0001 Japan

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Conclusion

- The criteria and methodology to evaluate the candidate corridor for HSR introduction are developed in this study
- The criteria and methodology are applied to India as a case study
  - Most of the present candidate corridors meet the necessary criteria
  - There are many city pairs not mentioned in present plan that meet the criteria
  - **India has many corridors suitable for HSR from the mid or long-term point of view !**

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Unit: INR

	Japan in 1960	India
Starting Salary	10,900 (Male) 8,650 (Female)	5,000-50,000
University-going Rate	10.3%	11% (2005)
Metro Fare (3km)	13.6	10
Bus Fare	10.2	5-10
Coca-Cola (500 ml)	34.0 (1965)	25
Railway Fare	1,210 (Limited Express, Tokyo-Osaka)	400-600 INR (AC-3 tire, Mumbai-Ahmedabad)

1 Japanese Yen = 0.68 INR

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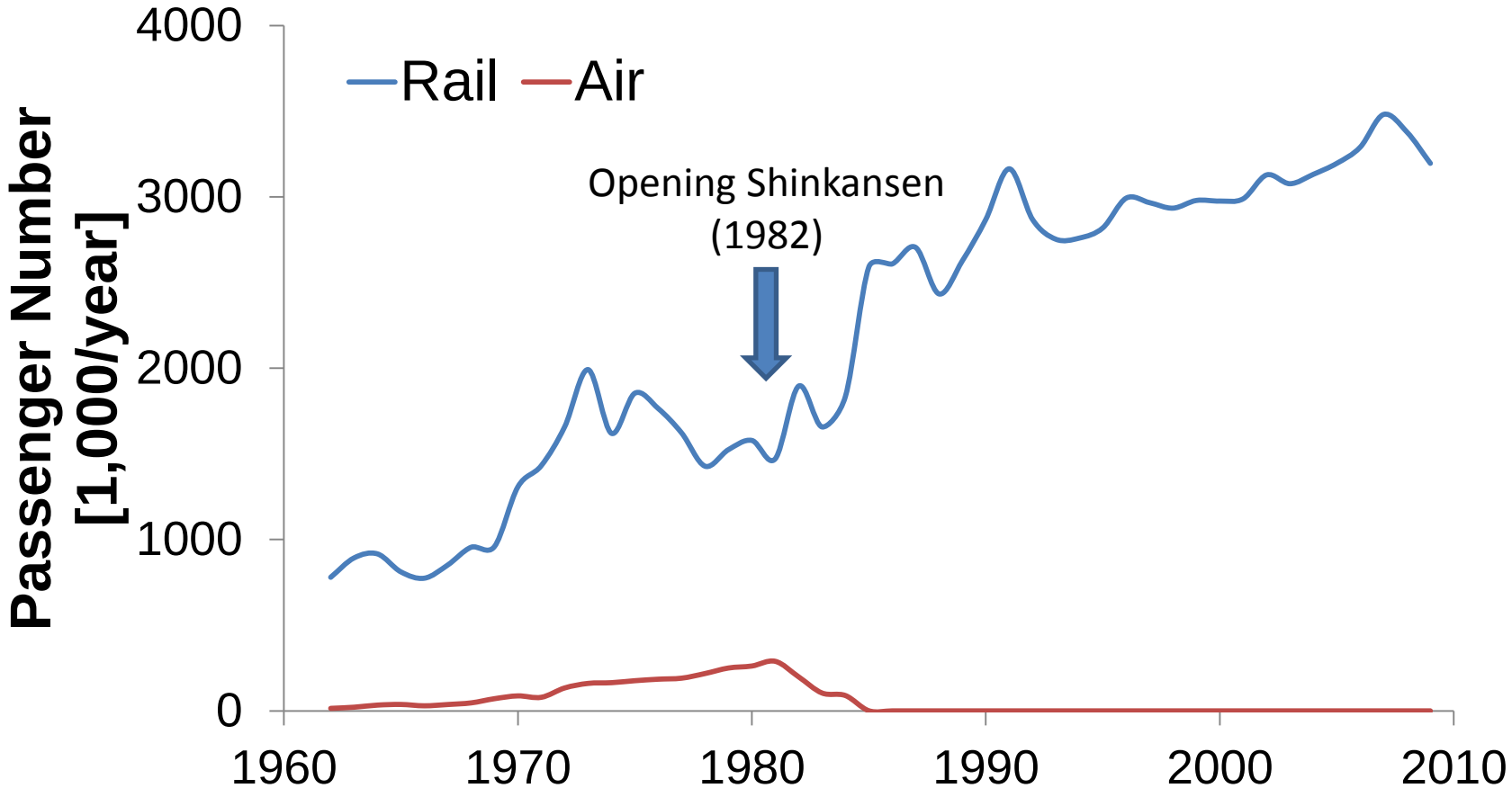
Tokyo-Sendai (325.4km)



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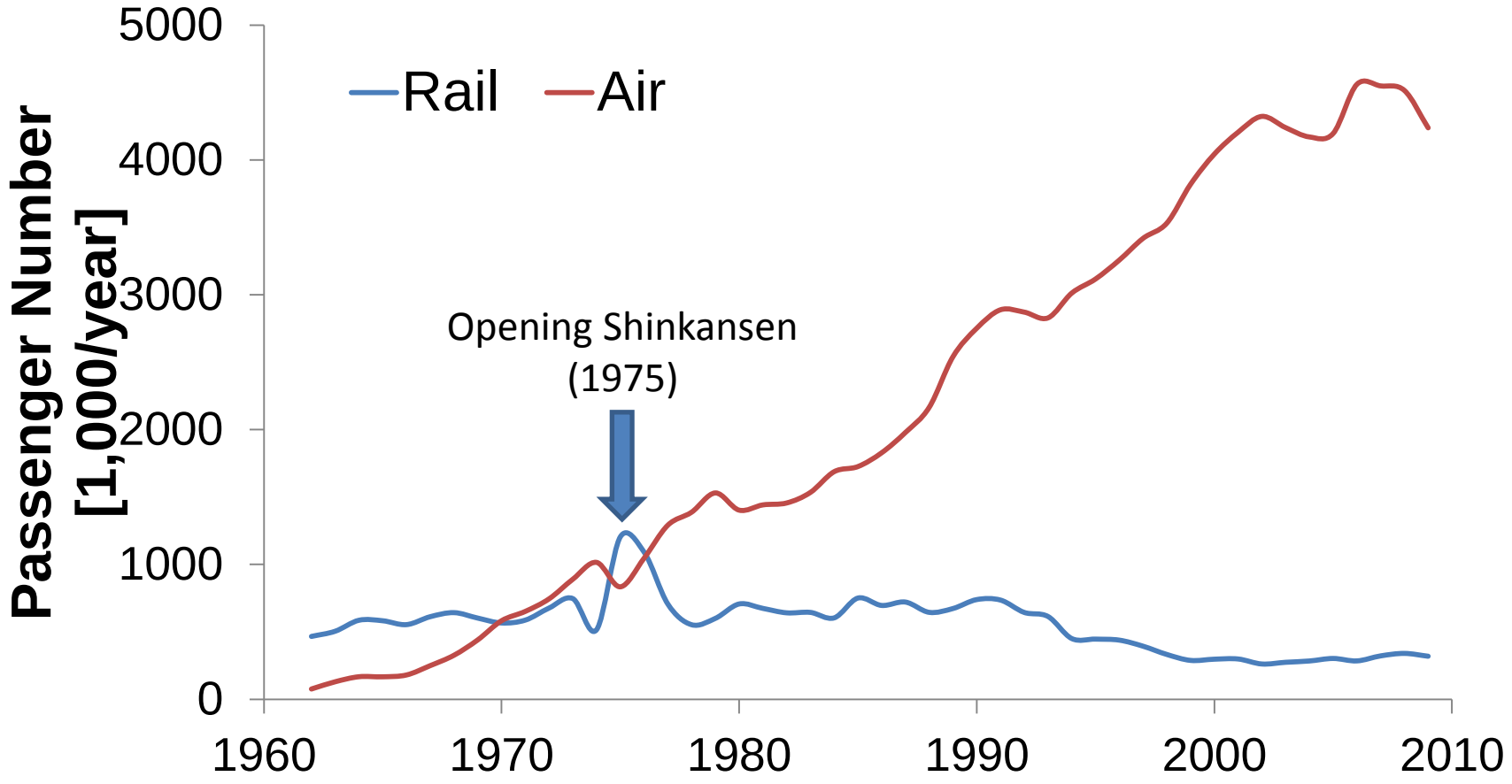
Tokyo-Fukuoka (1069.1km)



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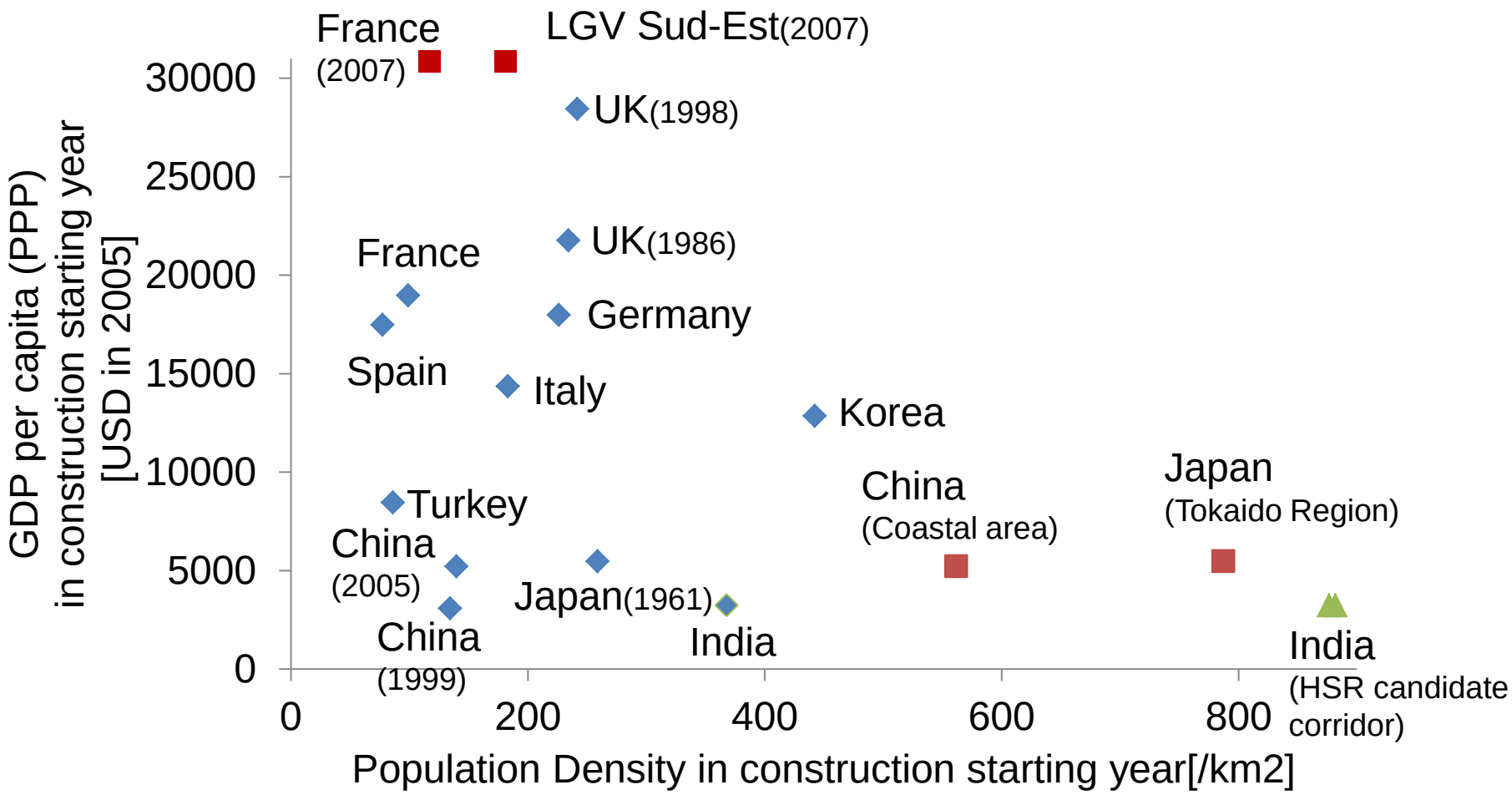
Population density



Contents of Criteria

Country/Region

- GDP per capita
- Population / Population density
- Distribution of large cities

→Does the country have aptitude for HSR introduction?

Corridor

- Railway passenger volume
- Corridor distance

→Select the candidate corridor

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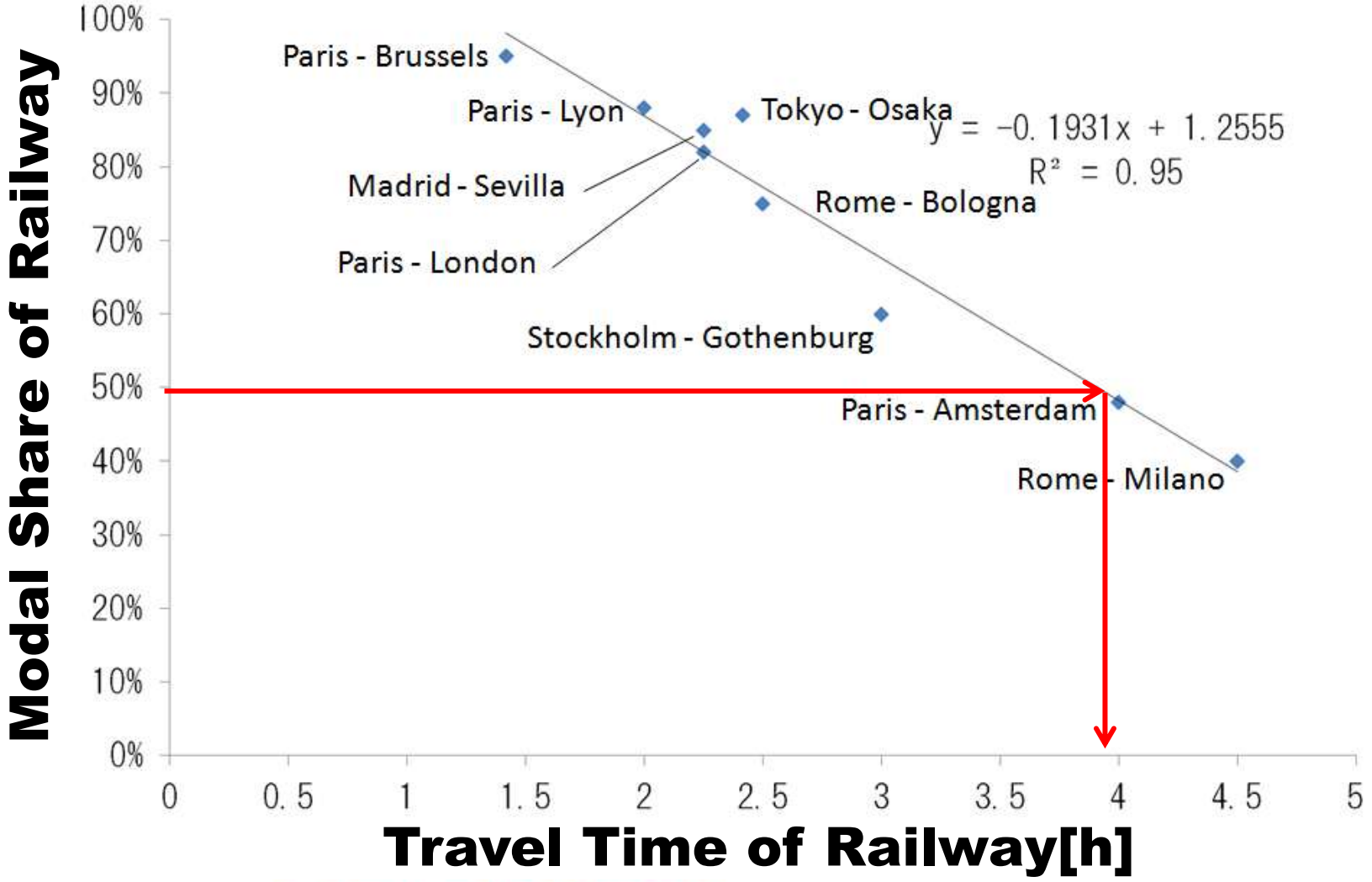
Corridor distance



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Rating Matrix(Examples)

OD-pare	Distance	0.5M+ Cities on Corridor	Rail Traffic Volume	No. of Airline	No. of Bus Service
Delhi-Lucknow	500 <	++	+++	++	+
Delhi-Chandigarh	500 <	+	++	+	+++
Mumbai-Ahmedabad	aprx. 500	++	+++	++	++
Chennai-Bangalore	500 <	-	+++	++	++
Kolkata-Puri	aprx. 500	+	+++	+	+
Chennai-Madurai	aprx. 500	+	++	+	++
Hyderabad-Vishakhapatnam	1000 <	+	+++	+	++

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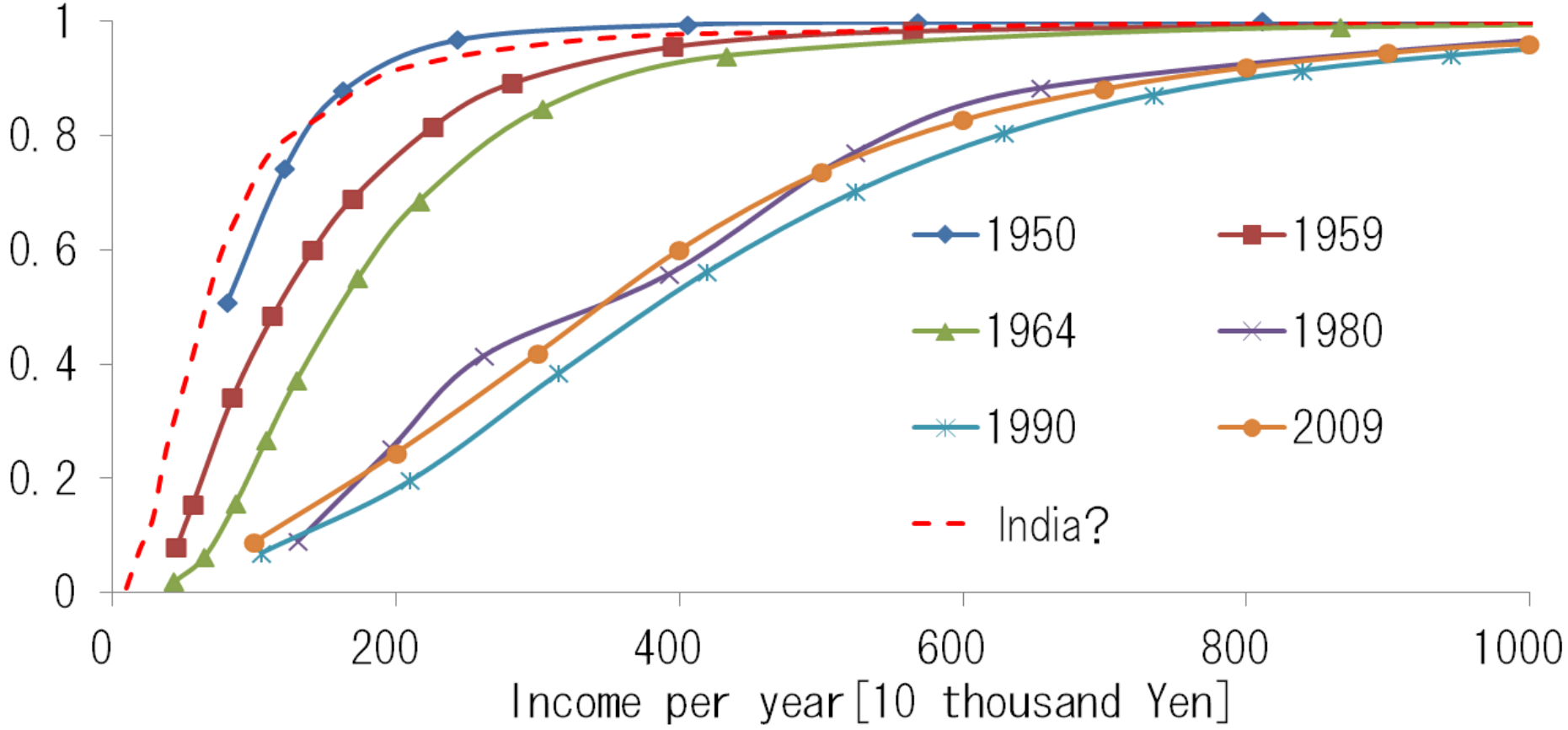
Income Distribution in India?



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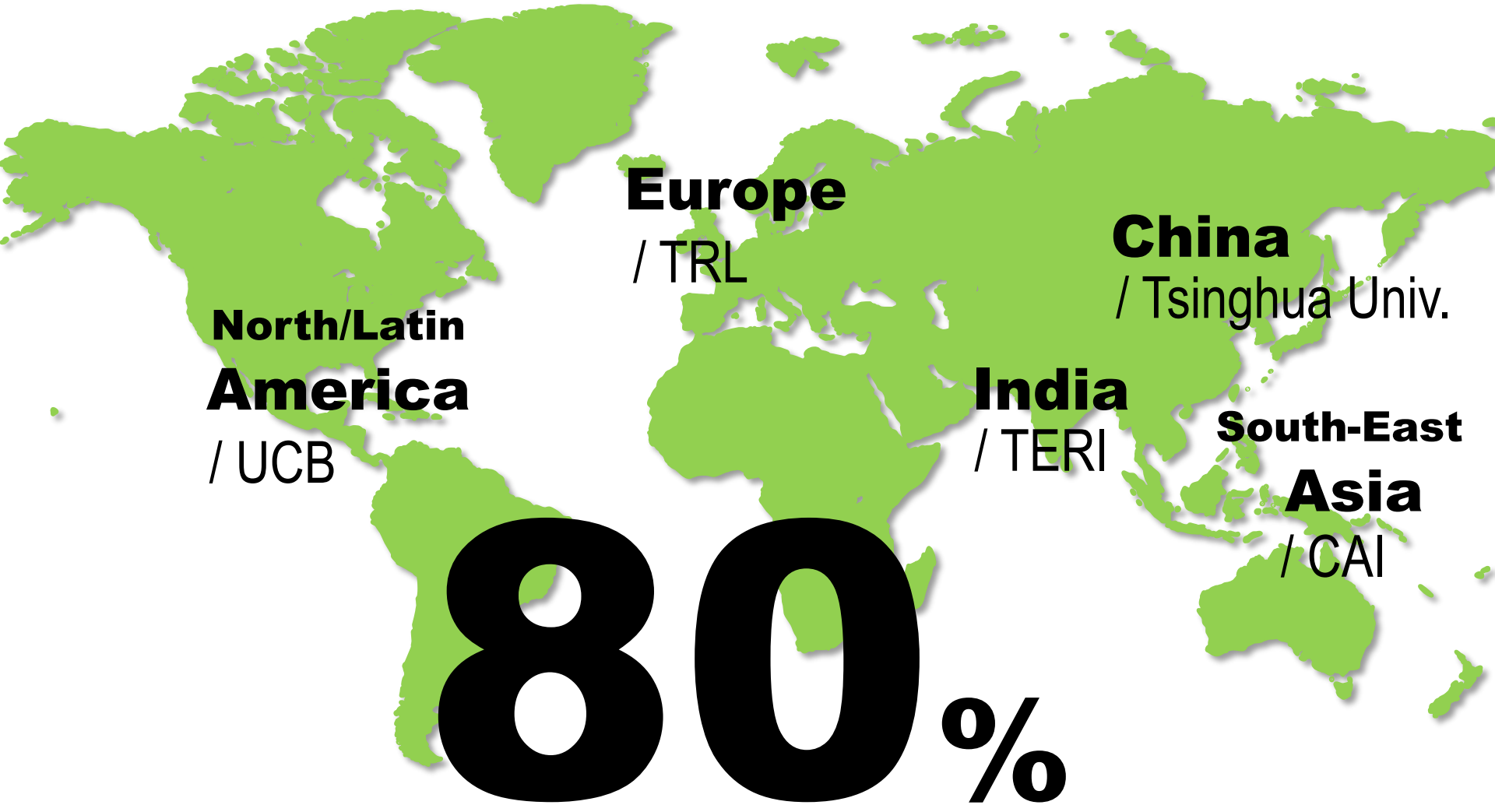

80%

of CO2 emissions from transport

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France
TGV

Germany
ICE

Spain
AVE

Korea
KTX

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HT65000

China
Hexie Hao

Real GDP per capita (PPP)

in construction starting year

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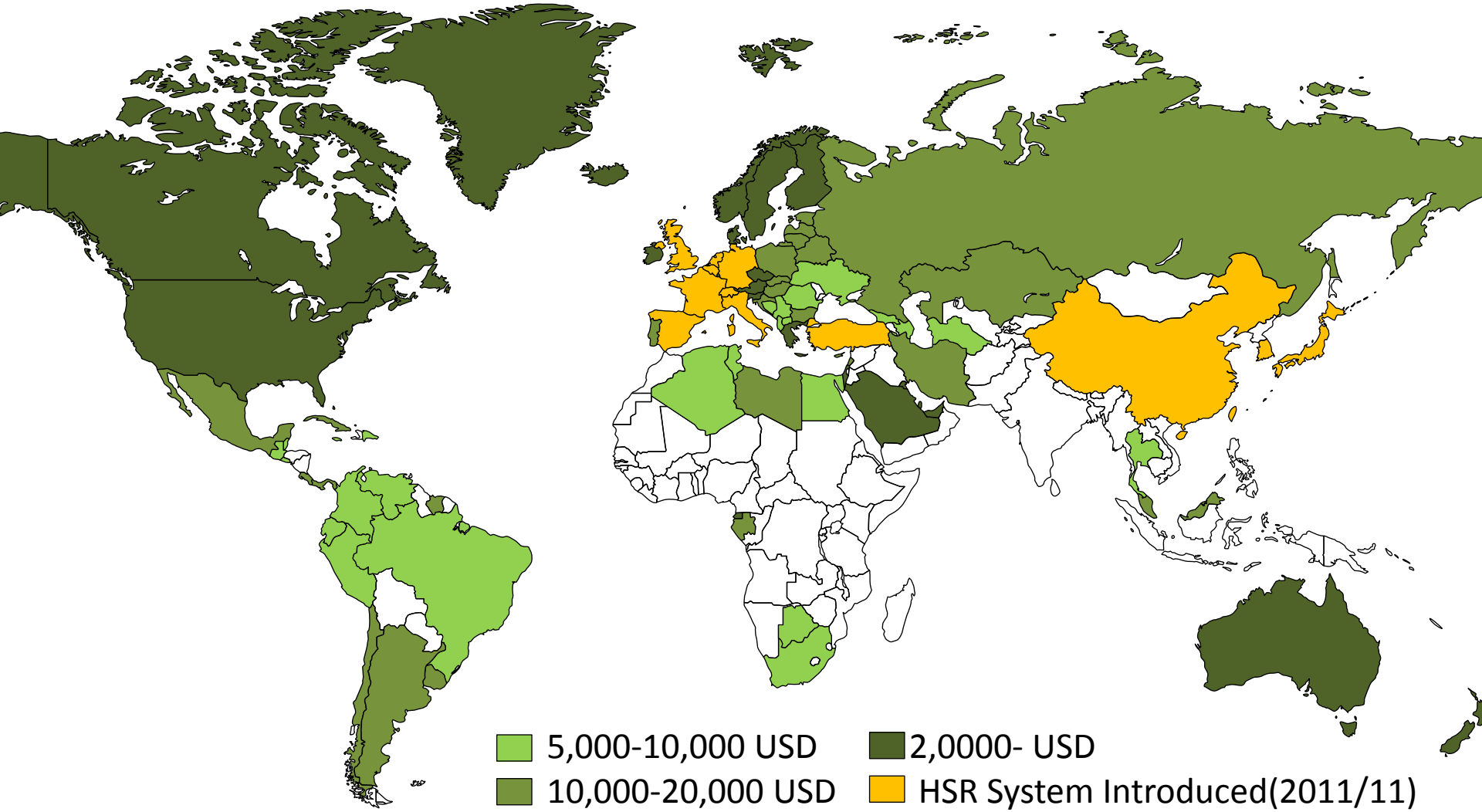
Real GDP per capita over 5000 USD (PPP) countries (2009)



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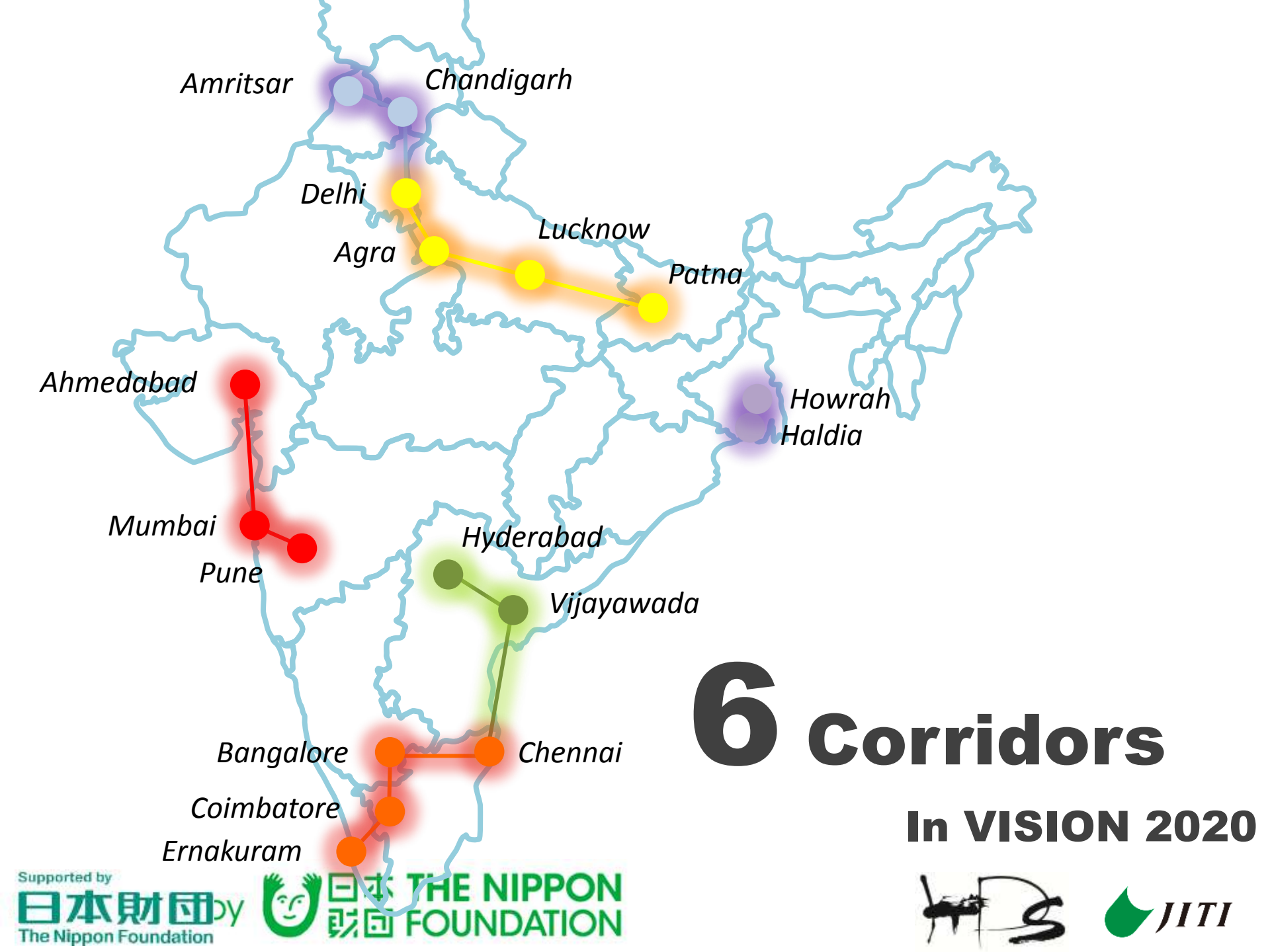

6 Corridors

In VISION 2020

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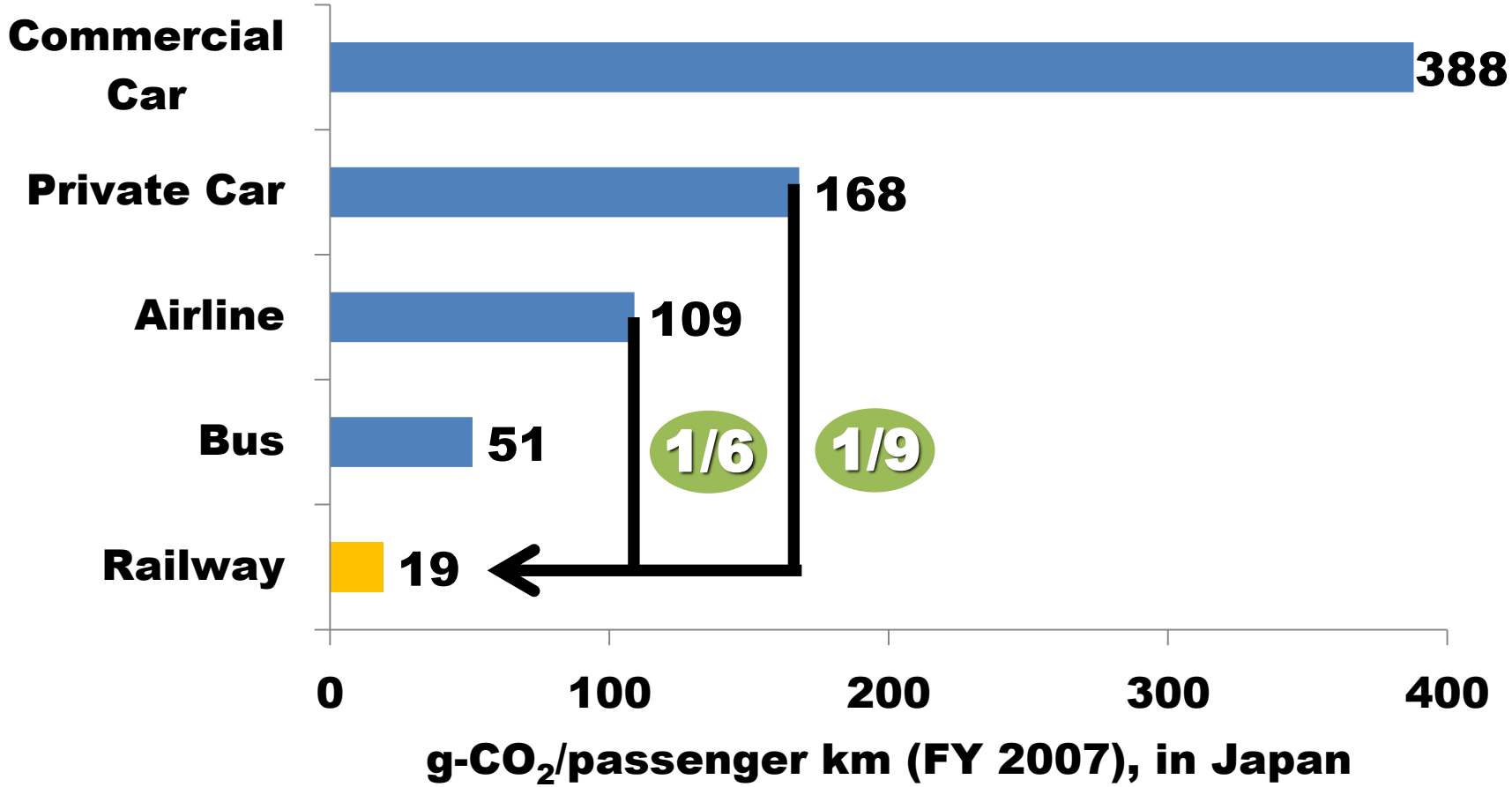
Rail is Environmentally Friendly!



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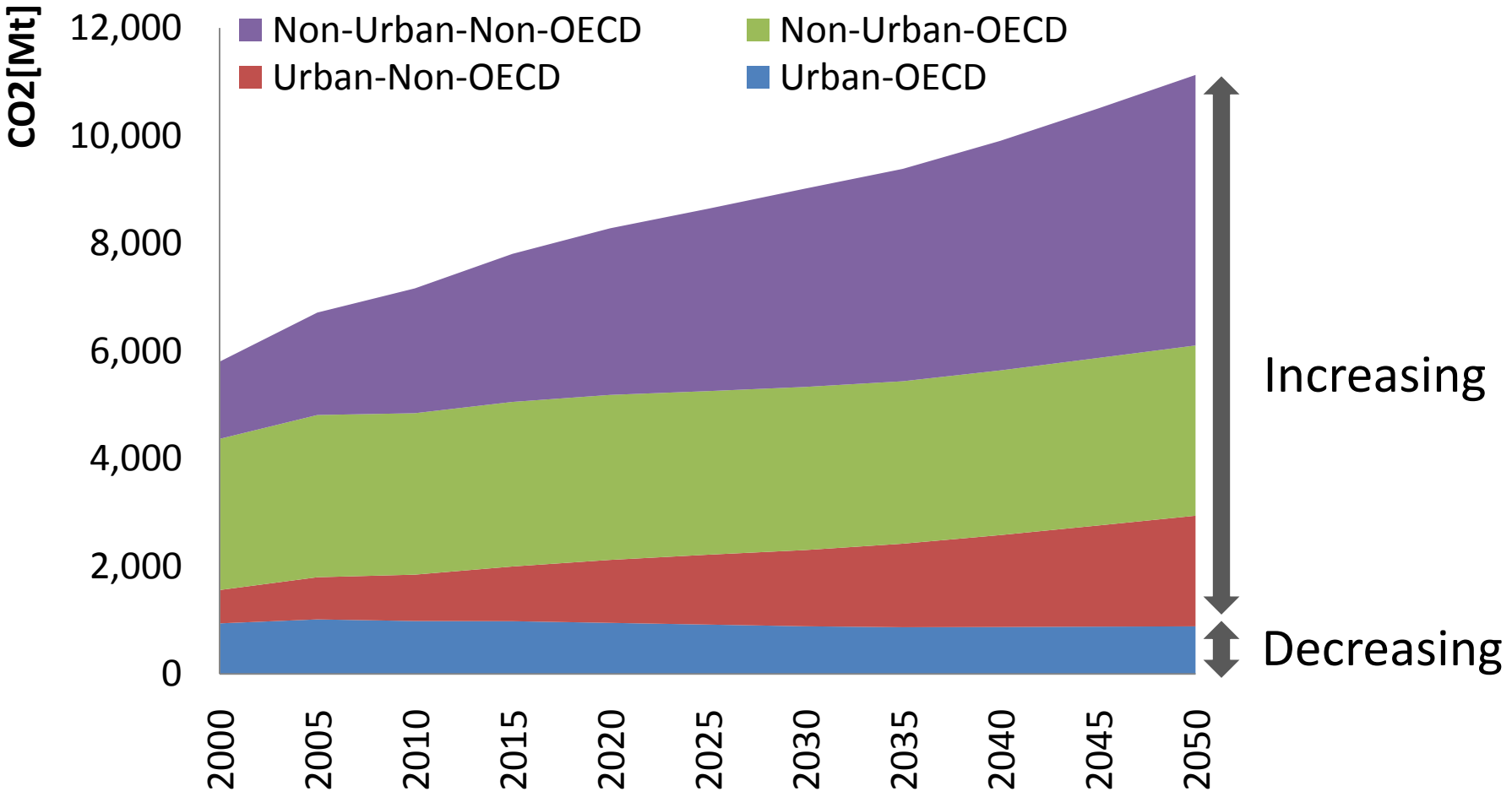
BAU Case by Region

CO2 Emissions from Transport Sector



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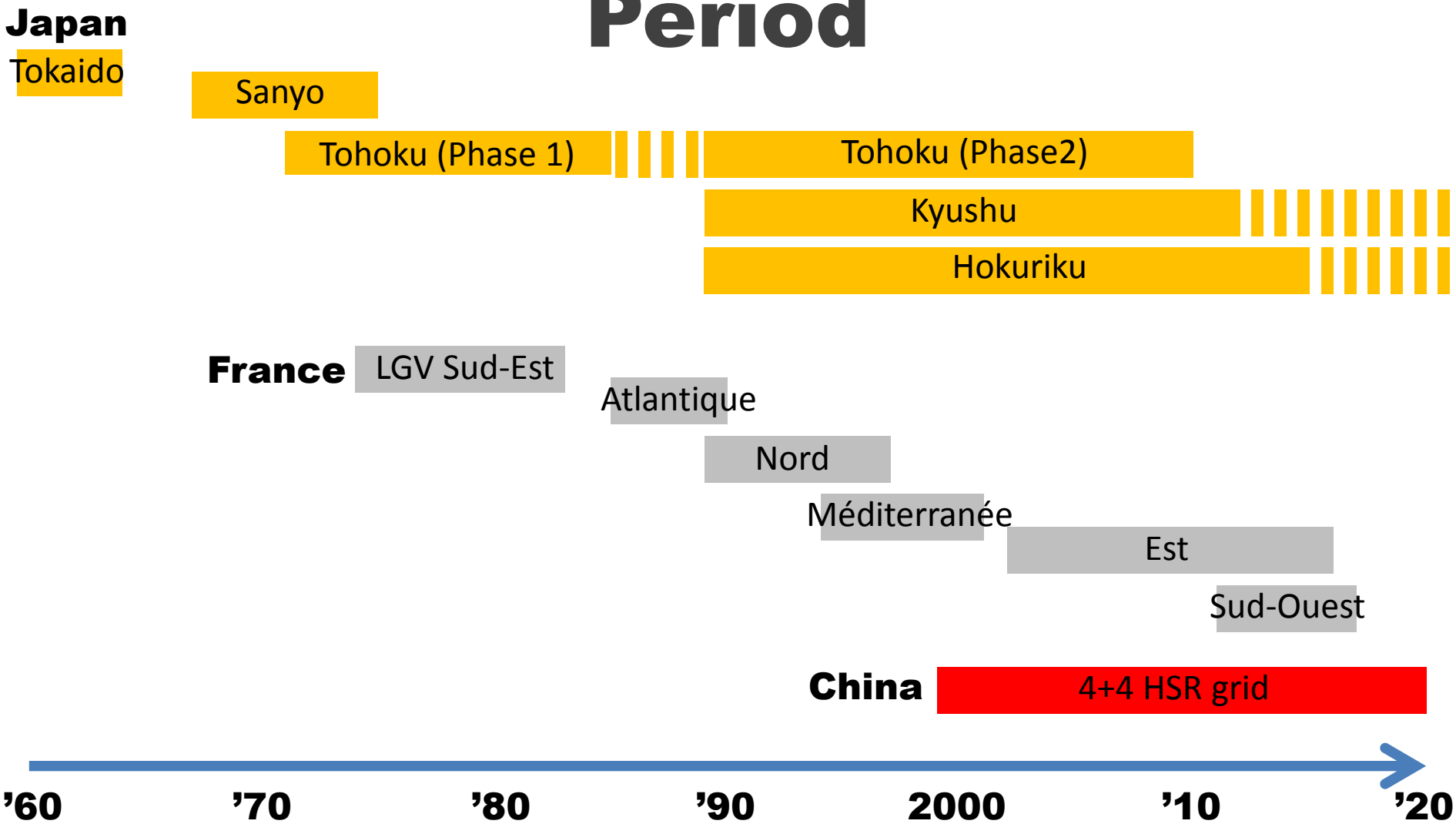
HSR Network Establishment Period



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