Criteria for HSR introduction and Application in INDIA

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Wednesday, 11 July 2012, Network planning
Introduction

- Develop the criteria and methodology for evaluating suitable HSR candidate corridors
  - Especially for emerging / developing countries

- Visioning future HSR network in India using the criteria
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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5,473 USD (1959)

Japan Shinkansen

18,980 USD (1976)
France TGV

17,982 USD (1973)
Germany ICE

17,487 USD (1987)
Spain AVE

12,862 USD (1992)
Korea KTX

Turkey HT65000

5,218 USD (2005)
China Hexie Hao

Real GDP per capita (PPP) in construction starting year
Present situation of India

- **Rapid Economic Growth**
  - GDP per capita of India will exceed 5,000 USD between 2015 and 2000

- **Population: 1.2 Billion**
  - Population will continue to increase

- **Population Density: 366.7/km\(^2\)**
  - It is appropriate to introduce a mass transport system like railways
  - Many Indian cities are distributed along belt-like networks

India will become a suitable country for HSR soon!
1962

1972-1975
(9-11 years later than Tokaido Shinkansen)

1982
(18 years later than Tokaido Shinkansen)
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)
### Rating Matrix (Examples)

<table>
<thead>
<tr>
<th>OD-pare</th>
<th>Distance</th>
<th>0.5M+ Cities on Corridor</th>
<th>Rail Traffic Volume</th>
<th>No. of Airline</th>
<th>No. of Bus Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delhi-Lucknow</td>
<td>500 &lt;</td>
<td>++</td>
<td>+++</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Delhi-Chandigarh</td>
<td>500 &lt;</td>
<td>+</td>
<td>++</td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td>Mumbai-Ahmedabad</td>
<td>aprx. 500</td>
<td>++</td>
<td>+++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Chennai-Bangalore</td>
<td>500 &lt;</td>
<td>-</td>
<td>+++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Kolkata-Puri</td>
<td>aprx. 500</td>
<td>+</td>
<td>+++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Chennai-Madurai</td>
<td>aprx. 500</td>
<td>+</td>
<td>++</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td>Hyderabad-Vishakhapatnam</td>
<td>1000 &lt;</td>
<td>+</td>
<td>+++</td>
<td>+</td>
<td>++</td>
</tr>
</tbody>
</table>
Additional Corridors

Beyond 2020?
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!
...Thank you for your kind attention