High Speed Rail
Best practices in the World

Lessons from Europe and Asia

Jack, DOOMERNIK
Principal consultant, Lloyd’s Register Rail Europe, the Netherlands
11th July, 16.00-18.00h, Session: Project Management
Content

- Introduction
- Demand for high-speed transport
- Competition between HSR and air transport
- HSR network capacity and traffic performance
- Three years of HSR in China
- Best practices and opportunities for HSR
Geographical breakdown of the global market

North America

European Union

former USSR

Middle East

Latin & South America

Africa

Asia-Pacific
The demand for high-speed transport

- Rising income leads directly to rising demand for mobility.

- As mobility grows, travelers shift to faster modes to remain within the fixed travel time budget of 1.1 h per day.

- The trend for Europe over the last 15 years shows a strong correlation between GDP and traffic volume.

- Per capita motorized traffic increased with 17%, where HS-modes have grown 58% between 1995 and 2009.

---

Jack, Doomernik
Principal Consultant, Lloyd’s Register Rail Europe, the Netherlands
11th July 2012, 16.00-18.00 h, Session: Project Management
Mobility and HSR demand in the world

- For USA, EU27 and China a strong GDP growth is forecasted for the next 5 years leading to a growing mobility and travel demand.

- Regarding GDP per capita Australia, USA, Canada, Japan and EU 27 are the leading economies giving good opportunities for High Speed travel modes.

- In BRIC countries High Speed Rail will develop depending on the governments’ transport policy.

Passengers may choose between air and HSR to stay within their travel time budget

- Rail travel time is the single most important factor determining market share
- When HSR takes more than 2 hours extra travel time air becomes preferent
- Available network capacity is a limiting factor for growth

Sources: - European Commission, Air and rail competition and complementarity, 2006
- Lopez-Pita, High speed rail modal split on air traffic density routes, 2010
High speed network in the world

- First HS-line opened in Japan in 1964
- Asia and Europe are taking the lead in HSR developments
- Rest of the world is following slowly

In 2009 the total length of the HSR network in Asia exceeded Europe due to the new-built projects in China

Source: UIC, High speed Lines in the world 2012, 2011 (planned HSR projects added by author)
Regional overview of HSR networks

- **Europe:** steady network development in 30 years time starting with TGV Paris-Lyon.

- **South-East Asia:** Japan as HSR innovator, strong growth in China. Australia and India are planning for a HSR future.

- **North America:** Lots of new projects planned but still an immature HSR market.

Source: UIC, High speed Lines in the world 2012, 2011 (planned HSR projects added by author)
**HSR performance**

- JR is the front runner in traffic performance due to the early adoption and steady development of HSR technology in Japan.

- In 2010 China has reached the same level in ridership due to strong network growth.

- In Europe SNCF accounts for more than 55% of the HSR performance, with DB being the second in row with 25%.

- There is a large variation in ridership for the world’s largest HSR networks in Asia and Europe.

- Ridership per km HSR network in Japan is more than twice the volume in China and EU27, but China will catch up the next decade as the network and GDP per capita continues to grow.

Source: UIC (Europe) and [http://whhh.fc2web.com/ktx/hikaku.html](http://whhh.fc2web.com/ktx/hikaku.html) (Asia)
Ridership after the first three years of High Speed Rail in China

- HSR induces extra travel demand
- Conventional rail passengers shift to HSR as well

Source: World Bank, High-Speed Rail – The first three years: Taking the pulse of China’s emerging program, 2012
Best practices and opportunities in the world

### Best practices

- Best practices in HSR can be found in Asia (Japan, China, Taiwan, Korea) and Europe (France, Germany, Spain, Italy) where HSR-services have gained more than 50% market share on specific corridors.
- HSR’s market share is developing well in countries with high GDP per capita and strong growth and where governments plan for HSR networks.
- CRH in China will become the world’s largest HSR operator in the coming years due further extension of the network and increasing GDP.

### Opportunities

- Besides HSR markets in Europe and Asia that will continue to grow over the next 20 years, opportunities in US, Canada and Australia are there, but investments in HSR infrastructure are needed to challenge air transport.
- On the longer run countries like Brazil, India and Russia may profit from HSR introduction in their transport policy.
...Thank you for your kind attention

Jack Doomernik
Lloyd’s Register Rail Europe
T +31 30 7524 700
F +31 30 7524 800
E jack.doomernik@lrrail.com
W www.lr.org