HSR 2013

MYSORE, INDIA

High Speed Rail Symposium

9th and 10th May, 2013, at SJCE Mysore, India

Report of "High Speed Rail (HSR) Symposium" 9th and 10th May 2013, SJCE, Mysore, India

Organized by

June - 2013

Report of "High Speed Rail (HSR) Symposium"

9th and 10th May 2013,
SJCE Campus, Mysore, Karnataka

Organized by:

S. J. C. E., Mysore (http://sjcemysore.org/index.aspx),
TEQIP(http://www.spfukar.com),
and Transportation Research Group of India (TRG)(http://www.trgindia.org)
in association with,
Fundacion Caminos De Hierro, Spain (http://www.fcaminoshierro.com/),

Summary of the Symposium:

The development of **High Speed Rail System (HSRS)** in India is still under consideration and discussion at various levels in the government, and the country is still to see the first HSRS running within the country. The aim of the symposium was to identify the various research, implementation, and capacity building issues related to development of HSRS in India and to identify an agenda for action and also for possible collaboration with Spain and other countries that have experience in HSRS, in developing HSRS in India. The symposium was of two days. The 1st day had an open seminar where invited expert presentations, by speakers from Spain, India and other countries, were made on the following themes:-

- International experience of HSRS.
- Status of HSRS and recent HSRS studies in India
- Research & Development opportunities and needs.
- Issues of optimum speed, freight railway transport in the new time, demand and economics impacts
- Technical issues: Maintenance and operation (problems, tasks and costs), design criteria and so on.
- PPP models, key aspects for funding and financing HSRS. etc.

Below are the details of presentation made on 1st day of symposium i.e. 9th May 2013:-

1st Session (2 hrs.)	1. Mr. Shri Prakash, TERI, New Delhi - Energy and environmental impacts of HSR along select corridors in India 2. Prof. G. Raghuram , IIM Ahmedabad– Issues for Developing High-Speed Rail Network in India 3. Dr. Eduardo Romo, Fundacion Caminos de Hierro, Spain - 25 Years of HSR Spanish Experience 4. Mr. Milind Nirmal, DB International GmbH - Mixed traffic on High Speed Rail Lines in Germany.
2nd Session (2 hrs.)	1. Dr. Murthy V. A. Bondada, Urban Transportation Engineers and Planners Casselberry, USA - Feasibility of HSR in India from Lessons Learned in USA 2. Dr. Julian Sastre, Fundacion Caminos de Hierro, Spain - The Effects of High-Speed Rail In Spain 3. Dr. K. A. Raju, Tata Consultancy Services (TCS), Mumbai – Passenger 360° 4. Dr. Eduardo Romo, Fundacion Caminos de Hierro, Spain - Infrastructure

	Technologies Innovations and Operational Safety
3rd Session (2 hrs.)	1. Dr. Ashish Verma, IISc Bangalore – Assessing the Environmental Impacts of High Speed Rail (HSR) for policy level decisions 2. Dr. Anbazhagan P., IISc Bangalore - Geotechnical Engineering for High Speed Train Ballasted Railway Tracks 3. Ms. Lila P. C., CDMSmith, Bangalore - Review of Forecasting Methodologies for High Speed Rail 4. Ms. Anantha Lakshmi P., CSTEP, Bangalore - Demonstration of Proof - of - Concept for looking at Alternatives for transport infrastructure

Altogether there were about 100 registered delegates on 1st Day of the symposium covering, international and national stakeholders in HSR, government officials, consultants, academicians, and students.

Taking forward the experiences and views shared on 1st day of symposium by experts and delegates, the 2nd day of the symposium focused on structured round-table discussion among invited expert group members on developing a concrete agenda for development of High Speed Rail System (HSRS) in India, and the proceedings and outcome of which are included in this symposium report. **Annexure-1** and **Annexure-2** contains the list of attendees on 2nd day of the symposium, and photographs of the meeting, respectively. It is expected that this report will serve as a useful reference and decision support to all related government and private stakeholders in India and abroad, in developing HSRS in India. The discussions of the Expert Group Meeting on 2nd day of symposium were moderated by **Mr. Shri Prakash, Distinguished Fellow, TERI University**. The expert group members discussed and sequentially addressed the following questions in different break-up sessions on 2nd day of the symposium:-

Session-1

1. What are the advantage and disadvantage of HSRS internationally and as perceived with respect to India?
2. How we compare developing HSRS vis-à-vis road and air transport infrastructure growth in India?
3. What are the factors related to India that can have positive influence on the growth of HSRS in India?

Session-2

4. What are the learning lessons from other countries for developing HSRS in India?
5. What are the policy level, planning level, engineering/technological level, interventions required to advance the development of HSR in India?
6. What are the implementation issues in the development of HSRS in India?

Session-3

7. What are important issues at all levels with respect to development of HSRS in India that requires research inputs?
8. What are the specific collaboration opportunities with other countries for developing pilot projects and examples of HSRS in India?

Outcome of the Symposium:

This section summarizes the outcome of the symposium as bullet points against each of the eight questions discussed in the expert group meeting.

State of HSR today in India

- Does not appear to be a national priority at the moment
- Plans by government to expand all modes by increasing capacity to carry more people
- Plans to improve commercial speed like, introducing medium speed trains on selected corridors by up-gradation of existing tracks
- Popular demand for better travel experience from middle class which is growing fast
- State governments keen on getting HSR especially southern states and Gujarat. But since railways is handled by Central government, priority needs to be expressed by Central government.

Question # 1: What are the advantages and disadvantages of HSRS internationally and as perceived with respect to India?

Advantages:

- Safety, comfort and reduced travel time
- Efficient use of rail infrastructure
- Create jobs and induces economic growth
- Helps in eliminating regional imbalance
- Pressure on growing urban areas can be relieved
- New technology – exposure and self sufficiency for some time
- India: HSRS will satisfy the latent demand that is present. We have captive riders instead of choice riders like in the USA
- India: HSR makes sense due to the wide geographical extent of the country

Disadvantages:

- High capital cost, maintenance and operation cost
- Transfer of technology required
- National vs. state subject issue. To overcome this states can be given freehand in these projects
- Alignments are predefined, which may have to be changed for HSRS
- No door to door service like in road based mobility using passenger cars
- Limited number of stops as compared to conventional railway system
- India: Political will is needed. Span of planning and implementation is long and change in government can cause problems

Question # 2: How we compare developing HSRS vis-à-vis Road and Air transport infrastructure growth in India?

- Share of rail at present is limited compared to road and air, but is slowly growing
- Difficult to bring frequent train services - Dedicated corridors instead will offer frequency option to passengers

- Choice of mode should be available all the time
- Competition (choice between various modes) is important for good services – always beneficial for the users
- Air travel fares might reduce due to competition by introduction of HSRS
- Policy level intervention needs to be introduced when predatory behavior is observed
- Length of routes, fare, travel time, and seamless connectivity will decide which mode is more efficient
- Right of way is usually expressed as a concern for HSRS but not for highways
- Political will to develop HSRS is important in India
- Infrastructure cost for HSRS is higher – is PPP a possible option?
- Energy and emissions needs to be taken into account – aviation sector is going to be increasingly unsustainable in future. Damaging effect in aviation is higher since emissions are released at a higher altitude
- Oil prices expected to keep increasing – air and road travel will keep getting expensive
- Safety issue more with road sector
- Electricity crisis in India – is HSRS viable in present conditions?

Question # 3: What are the factors related to India that can have positive influence on the growth of HSRS in India?

- Do nothing scenario – keep increasing expressways - increased congestion – economic activity will get affected
- Accidents – HSRS is the safest mode
- Unleash economic activity in and around HSRS station – economic activity goes up
- India : Latent demand is present – people are ready to pay for tier 2 and 3 in trains presently
- Vast geographical extent of the country

- Wide railway network in place that can be utilized effectively.
- Air travel is already getting costlier.
- HSRS can act as a catalyst to spread out economic growth, if coupled with policy interventions.
- Optimum range of distance and feasibility in India – something that needs to be researched

Question # 4: What are the learning lessons from other countries for developing HSRS in India?

- Factors why HSRS were implemented in other countries
    - Demand
    - Economic development
    - Connectivity across countries
    - Energy and environmental issues
- How was it implemented?
    - Policy implementation
    - Technical capability and good institutional set-up
    - Close collaboration with academia and research institutions
    - China – large population similar to India
    - Spain – developed by combining best of technologies from other countries

- Funding Options – PPP/Private investment
- India is severely lagging behind in terms of planning and implementation of HSRS, particularly since China has already developed more than 9000 km of HSRS network.
- Taking decision at this stage is easier for India, since so many international examples already exist to learn and take advantage.
- Speed selected for different corridors can show different results
- New infrastructure should go for very high speed corridor – Keep travel time the target in that case.
- High impact on mobility observed in other countries
- Shadow effect observed in Spain
- Our issues and requirements: Land acquisition is an since India is a democratic country. Difficult to follow China
- Germany – Railways successfully privatized in 1990s
- Technology aspect: every country developed their own technology. However, Spain developed by combining best of technologies from other countries
- Important to segregate HSRS infrastructure development and operation
- Amount of research required for developing new technology is huge and can take time

Question # 5: What are the policy level, planning level, engineering and technological level interventions required to advance the development of HSRS in India?

- Planning Commission can take up a study to define the desired modal share to be carried by HSRS and other modes.
- Important to have separate High Speed Rail Authority (HSRA) to construct and manage HSRS, as well as a separate Act.
- Policy making body and executing body should be different. Power to be entrusted on the policy making authority should be well defined
- Integration with other services
- In spite of a large railway system in India, dearth of professionals specialized in Railway Engineering. Important to establish focused electives at Undergraduate level and Postgraduate programmes in Railway Engineering.
- Realistic model for planning level decisions : National Rail transport model leading to regional rail transport model
- International collaboration and testing of technology in Indian conditions.

- Lead time required for planning, design and execution needs to be defined
- Standard documents need to be prepared by planning commissions
- Fare fixation freedom and fare policy

Question # 6: What are the implementation issues in development of HSRS in India?

- Upgrade Existing Right of Way v/s New Right of Way?
- Route Fixation
  - Origin, Destination, Intermediate Stations
- Choice of Technology Partner, need for Standards
- Choice of Demonstration Route
  - Minimum Viable Route Length?
- Location of Stations
  - City Centre v/s Periphery, Intermodal Connect?
- Surface v/s Above Ground v/s Under Ground?
- Choice of Speed and Gauge
- Institutional capacity
- Interoperability beyond Core Networks
- Land Acquisition, Environmental Clearances
- Pricing
- PPP or Contract, Viablility Gap Funding
- Part of Railways v/s Independent Organization?
- Regulation

Question # 7: What are the important issues at all levels with respect to development of HSRS in India that require research inputs?

- Evaluation of characteristics of HSRS in the world
- Modeling and forecasting for multimodal system and alternative analysis
- Best ways to estimate ridership for HSRS
- Station planning and design
- Geotechnical aspects to be taken care for HSRS
- Elevated/underground or on the ground?
- Double decking existing lanes as an option
- Optimum range of distance where HSRS is feasible in India
- What is required to make HSRS feasible on long distances also?
- Optimum sustainability benefits on what distance range?
- Research in figuring optimum HSRS network incorporating intermodal integration

Question # 8: What are specific collaboration opportunities with other countries for developing pilot projects and examples of HSRS in India?

- Our technology or borrow best of technologies? Spanish experience can be utilized.
- Learning privatization experience from DB, Germany
- Standards can be established taking inputs from other countries
- Bring technology to Indian standards – collaborate and develop technology
- Collaboration on:
  - Capacity building
  - Common research
  - Stakeholder engagement

Annexure-1

List of Expert Group Meeting Attendees.

Name	Affliation
Dr.Ashish Verma	President (TRG) And Asst.Prof.,IISc Bangalore
Mr.Shri Prakash	Distinguished Fellow , TERI
Mr.Varun Raturi	IISc Bangalore
Dr.K.A.Raju	Consultant, Tata Consultancy Sevice Ltd.
Dr.Murthy Bondada	President, Urban Transporttion Engneers & Planners, Florida, USA
Mr.Harsha Lingam	EBTC
Ms.Anitha Niranjan	CIM Global and TRG
Mr.Suresh.B	IISc, Bangalore
Mr.Niranjan.G.Hiremath	IISc, Bangalore
Mr.Rahul.T.M	IISc, Bangalore
Dr.P.Anbazhagan	Asst.Prof, IISc, Bangalore
Mr.Siddappa.P.N	Jssate, Bangalore
Mr.Prabhushankar	Jssate, Bangalore
Ms.Anantha Lakshmi.P	CSTEP , Bangalore
Dr.M.S.Prabuswamy	SJCE , Mysore
Mr.B.B.Sankaram	Aarvee Associates
Mr.Dinesh Kumar.H.D	IISc, Bangalore
Dr.Rajat Rastogi	IIT Roorkee
Mr.Amalingayya.B.H	IISc, Bangalore
Mr.Rahul.L.Kadam	IISc, Bangalore
Ms.Anusha.C.S	IISc, Bangalore
Mr.Raja.K	IISc, Bangalore
Mr.Milind Nirmal	Deutsche Bahn International
Ms.Bina C.Balakrishman	Independent Consultant
Mr.Eduardo Romo	Fundacion Caminos De Hierro , Spain
Mr.Julian Sastre	Fundacion Caminos De Hierro , Spain
Ms.Malvika Dixit	IISc, Bangalore

Annexure-2

Photographs of Expert Group Meeting.

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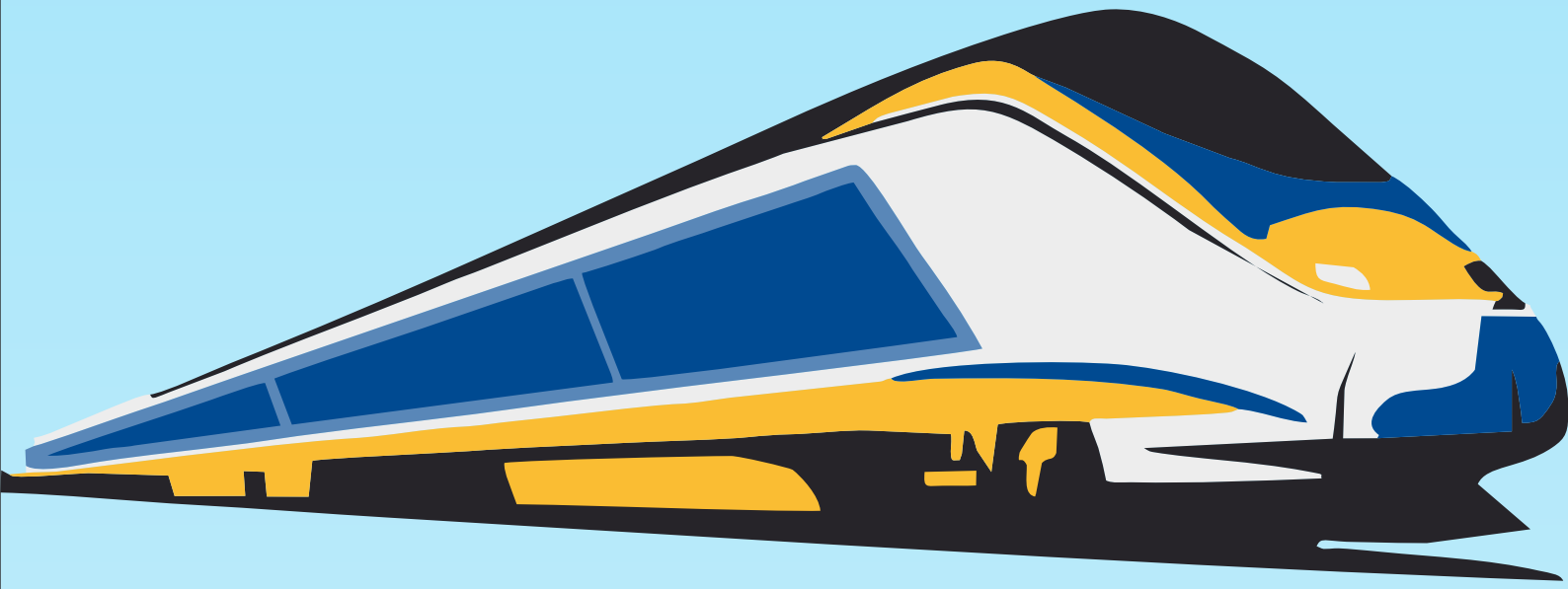

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