



# Development of High Speed Trains in India

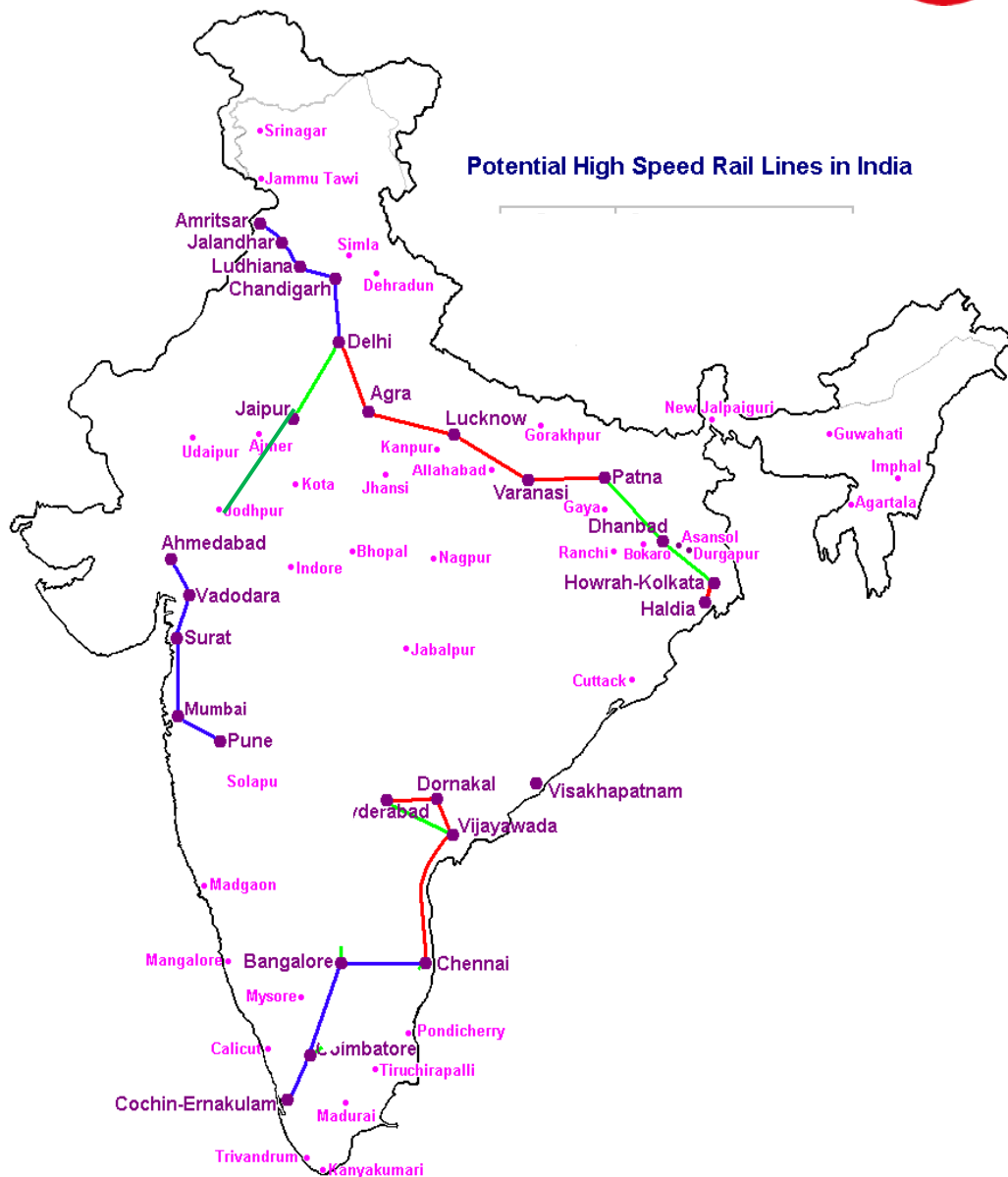
Girish Pillai,  
Advisor Infrastructure  
Ministry of Railways , India  
19<sup>th</sup> November 2013, New Delhi



# Selected Corridors for Study



- 1 – Pune-Mumbai-Ahmedabad, 650 km approx.(completed)
- 2 – Delhi-Chandigarh-Amritsar, 450 km approx.
- 3 – Hyderabad-Dornakal-Viajayawada-Chennai, 665 km approx.
- 4 – Chennai-Bangalore-Coimbatore-Ernakulam, 650 km approx.
- 5 – Howrah-Haldia, 135 km approx.(completed)
- 6 – Delhi-Agra-Lucknow-Varanasi-Patna, 990 km approx.(completed)
7. – Delhi-Jaipur-Ajmer-Jodhpur 591 km approx.

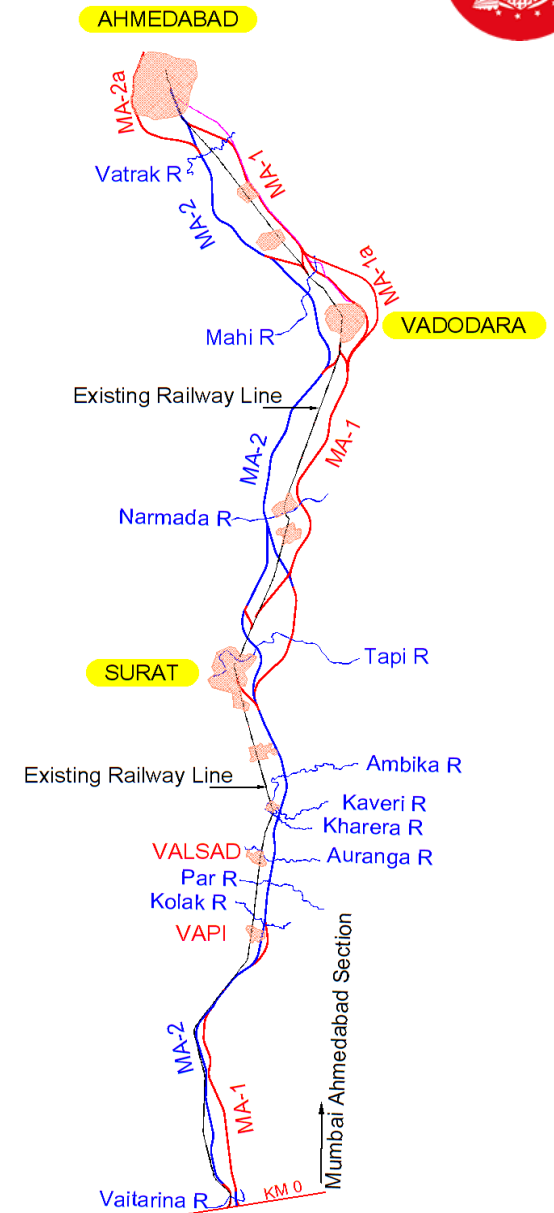




# Salient Features RITES Pre feasibility Report: Mumbai- Ahmedabad Corridor

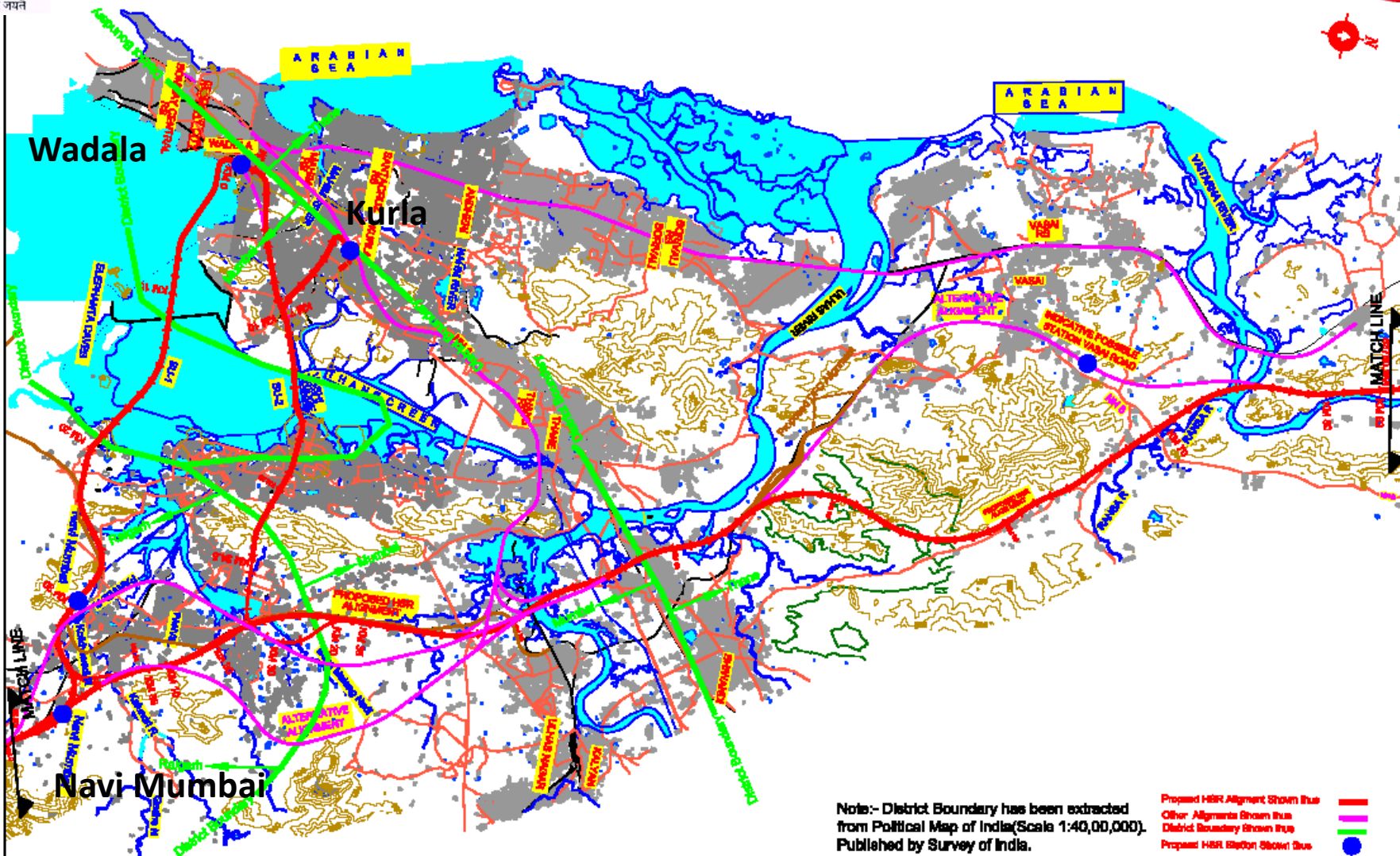


- Study done in 2010 by RITES, Systra and ITALFERR
- Length- 534 km
- Journey Time of 1 hour 52 minutes
- 12 Million passengers per year in 2021 on HSR
- Operation speed -350 Km/h
- 5 new Stations at Wadala, Navi Mumbai Airport, Surat , Vadodara and Ahmedabad
- Runs through the most urbanized states in India with cities of industrial importance.
- Approximate existing air traffic of 7,000 passengers per day and upper class rail traffic of 8000 passengers per day
- Business Development Study by SNCF and Feasibility Study by JICA are being undertaken





# Approaching Mumbai CBD



Note:- District Boundary has been extracted from Political Map of India(Scale 1:40,00,000).  
Published by Survey of India.

Proposed HSR Alignment Shown Blue  
Other Alignments Shown Red  
District Boundary Shown Black  
Proposed HSR Station Shown Blue

REVISION	DESCRIPTION	DATE

Ministry of Railways  
(Railway Board)  
Govt. of India, New Delhi

CONSORTIUM OF SYBTRA, ITALFERR and RITES

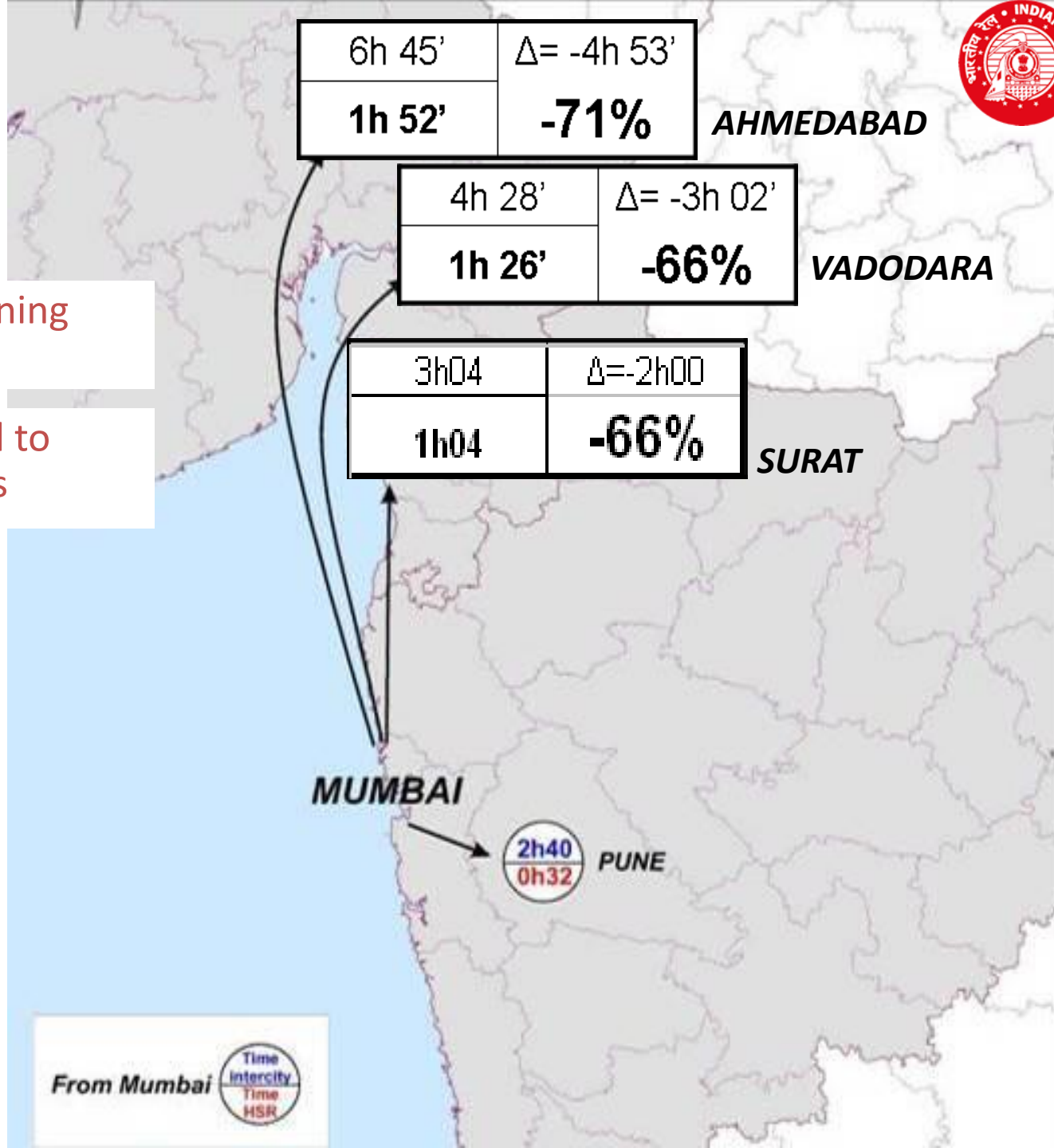
A Government of India Enterprise  
INCORPORATED IN INDIA  
REGD. OFFICE: NEW DELHI  
TEL: 011-26100100  
FAX: 011-26100100

PRE-FEASIBILITY STUDY  
PUNE-MUMBAI-AHMEDABAD  
HIGH SPEED LINE  
Index Plan  
Section: Mumbai-Outer  
(KM 0 to KM 83.76)

DESIGNED BY	ISSUED BY	APPROVED BY
CHECKED BY	REVISION	DATE
DATE	DATE	DATE
SCALE: A2 = 1:1,00,000 A1 = 1:1,00,000	TURNO	
DATE: 01/11/2009		



# Travel Time



Substantially shorter running times

Savings of 2/3 compared to existing running times

From Mumbai

Time Intercity	2h40
Time HSR	0h32



# Project Investment



Completion Cost in 2021

	<b>INR in Crores</b>
Construction Cost	46,256
Rolling Stock	3909
Cost Escalation	8217
IDC	4335
Preliminary Expenses	462
<b>Total</b>	<b>63,180 ( Euro 8 billion )</b>
<b>Cost/km</b>	<b>118crore( Euro 15 million)</b>

## Non Suburban Passenger Traffic Profile of IR (2011-12)

Segment	Originating Passenger Million ( percentage )	Revenue in billion INR ( percentage)	PKM (billion)	Revenue per PKM ( INR)
Total Non Suburban	3847 (100%)	263 .21 (100%)	902 (100%)	0.29
Upper Class Non Suburban	112 (3%)	78.51 (30%)	72 (8%)	1.09
Second Class Non Suburban	3735 ( 97%)	184.69 (70%)	830 (92%)	0.22
Second Class Mail Express	1188 (31%)	145 (55%)	548 (60%)	0.26

**The tariff levels of INR 7 and 4.5 per PKM recommended by Consultants**

# Comparison of Existing Upper Class Tariff with possible HSR Tariff ( Mumbai- Ahmadabad corridor)

Class	Tariff in INR	Approx. HSR Tariff in INR
Executive Class Chair Car	1680	3700
Chair Car	875	
AC First Class	1690	
AC Second	1000	
Third AC	710	





# Key Issues for HSR in India



- Customer: Business traveller or Daily commuter or Others
- Tariff levels : High sensitivity to price
- Speed : 250/ 300/ 350 kmph
- Connectivity with Existing corridor or isolated ???
- Technology Options
- Appropriate Financial Structure
  - PPP or Government
  - Extent of Government Funding and Risks by Government
  - Soft Loans
- Appropriate Organisational Structure
  - Government or Private entity
  - Infrastructure and Operations Control



# Possible Financial Models for IR



## Model-1

- Funding through budgetary resources by the Government
- IR fully controls the development of high speed in India
- Infrastructure both civil and systems is constructed by Indian Railways through a PSU under MOR
- Indian Railways takes all the risks without having adequate expertise

## Model-2

- Complete PPP-DBFOT Concession
- IR will be able to insulate itself from construction, financing and traffic risks
- Private sector may not have the appetite to absorb such a huge infrastructure project
- Substantial government support will still be required for land acquisition, rehabilitation, permitting commercial development of space, shifting utilities etc
- Most of the European PPP projects are DBFM concessions where Operating risks are taken by Government.



## Model-3

- Indian Railways implement the project with funding assistance from multilateral/bilateral agencies
- Soft loans can be secured either for constructing civil infrastructure/systems infrastructure or for both civil and systems infrastructure.
- Government to Government cooperation –Foreign rail Companies take majority stake in the venture and implement the project and operate it for a predefined long-term concession period



## Model-4

- Government to Government cooperation combined with PPP
- Infrastructure component of the HSR (track, overhead equipment, signaling, stations etc) could be constructed through government to government technical cooperation and assistance.
- Operation and maintenance and business aspects of the corridor could be bid out to a concessionaire for a relatively short period of time, say, 15-20 years with positive or negative grant.
- Flexibility of choosing an appropriate global player for operations and maintenance



# PPP Project Structuring



OPTION I - Design, Build, Finance, Operate and Transfer (DBFOT) of the entire project by a single Private Developer, who will be responsible for construction and operations and maintenance, thus there will be no interface risk and all revenue risk can be transferred to the private developer.

OPTION II - Unbundling the project into different components, so as to make the project components attractive to private players from the perspective of affordability in terms of size and risk allocation.



Thanks