



# High-Speed Rail: California in Context

World Bank Transport Thematic Group

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# California in Context

- Experience in other countries
- Comparison with California

# HSR Experience: It Works!?

## ■ Japan:

- Exclusive “Shinkansen” system from Tokyo to Osaka in 1964. Partly financed by World Bank loan...
- Now covers most major cities
- 11.5 billion passengers, no fatalities from train accidents
- Some lines “profitable,” others maybe not
- Old JNR “privatized” beginning 1987 Now 6 companies, 4 profitable.

## ■ France – TGV 1981

- Uses both HSR and conventional lines
- Serves most major cities and connects to Switzerland, Germany, UK, Belgium and Netherlands
- Some lines “profitable”: SNCF unprofitable
- No fatalities from accidents

# HSR Experience

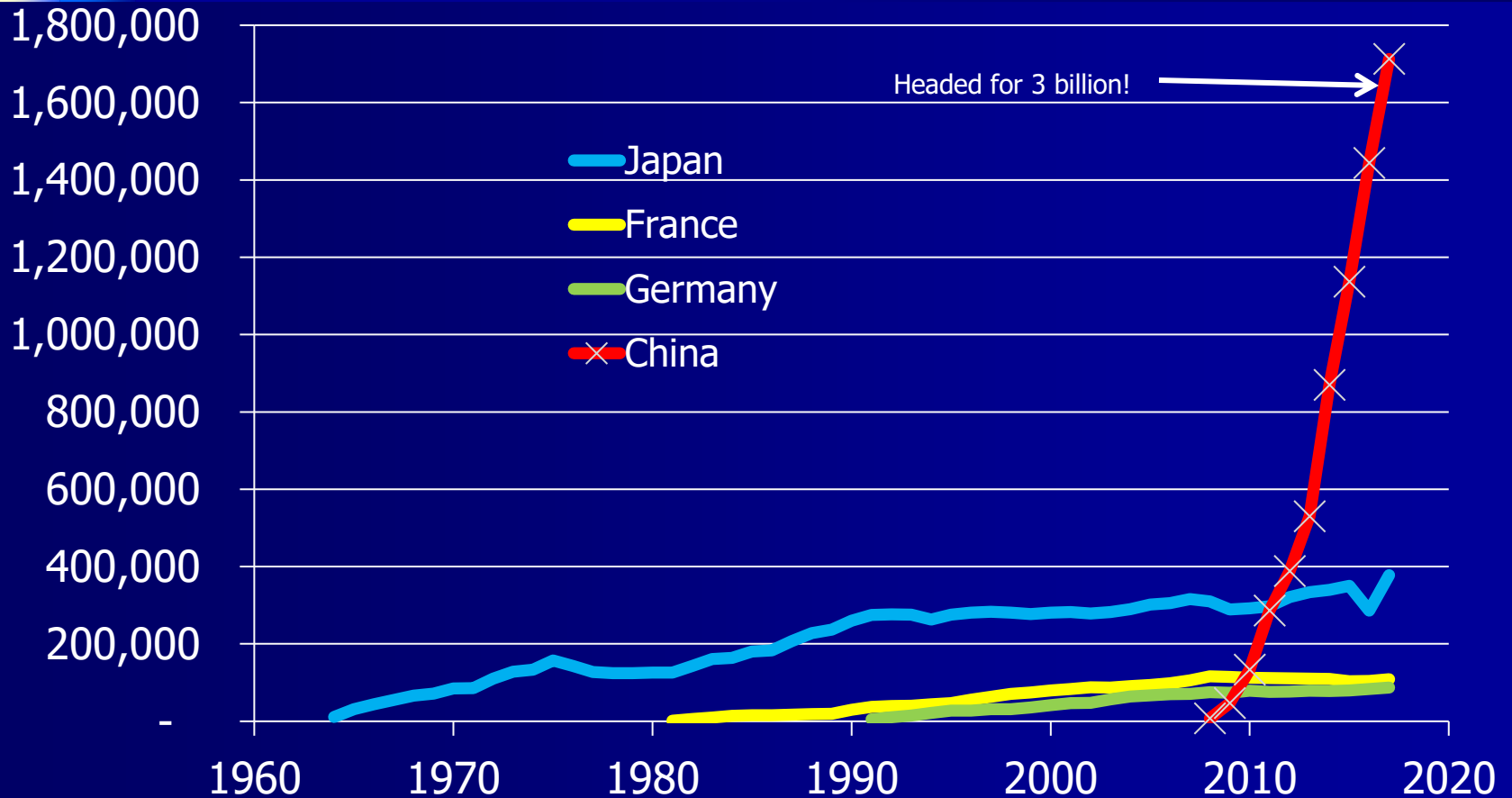
- Germany – ICE 1991
  - Mixed speed system (speeds and lines)
  - Germany, Austria, Switzerland, Belgium and Netherlands
  - One major accident 101 fatalities
  - DB major financial problem for Germany
- China – started service 2008 (CA Prop 1A)
  - Over 21,000 Km today, headed for 38,000. Exclusive system
  - Multiple objectives, not just “profitability”
  - Financial impact uncertain (high debt)
  - Wenzhou accident, 40 fatalities, low speed signals

# HSR Systems Elsewhere

Profile of Higher Speed Railways						
Country	Km of Higher Speed Line			2017 HSR Passengers (000)	2017 HSR Passenger-Km (000,000)	Average Trip Length (Km)
	> 250 Km/hr	160 to 250 Km/hr	Total			
Japan (4 JRs)	2,849		2,849	377,441	101,247	268
China	10,480	11,155	21,635	1,517,800	577,635	381
Taiwan (THSRC)	350		350	60,570	11,103	183
Korea (KTX)	149		657	59,669	14,869	249
France (RFF/SNCF)	2,166		2,166	108,721	58,280	536
Germany (DB)	1,104	1,511	2,615	86,732	28,502	329
Italy (FS)	909	1,718	2,049	23,882	5,513	231
Spain (ADIF/RENFE)	2,482	713	1,255	22,955	6,514	284
Sweden*		na	na	9,918	3,604	363
Belgium (SNCF)	108		108	6,400	1,500	234
Netherlands		120	120	4,098	413	101
UK**		10,869	10,869	10,300	4,825	468
U.S. (Acela)		596	596	3,442	1,048	305
U.S. (NEC Regional)		596	596	8,570	2,142	250
<b>CAHSRA (Phase I)</b>	<b>741</b>	<b>97</b>	<b>837</b>	<b>42,000</b>	<b>16,002</b>	<b>381</b>

# Annual Passenger Volume

(000)



See Table 2 for details

# Structures Differ, and They Matter

<b>Organization and Ownership of Higher Speed Railways</b>					
<b>Country</b>	<b>Ownership of Infrastructure</b>	<b>Multiple HSR Access?</b>	<b>Multiple Access by Non-HSR</b>	<b>Private Operators for HSR?</b>	<b>Access Regime</b>
<b>Japan (4 JRs)</b>	Private Corp	No	No	Yes	Closed
<b>China</b>	Public Corp	No	No	No	Closed
<b>France (RFF/SNCF)</b>	Public Agency	No	Yes	No	"Open"
<b>Germany (DB)</b>	Public Agency	Yes	Yes	Yes	Open
<b>U.S. (Acela)</b>	Public Corp	No	Yes	No	Limited
<b>U.S. (NEC Regional)</b>	Public Corp	No	Yes	No	Open
<b>CAHSRA (Phase I)</b>	Public Agency	No?	Yes	Yes	Limited

# The Situation in California

- How it got started
  - Early FRA studies 1980 (I managed)
  - 1997 FRA studies
  - 2000 “Business Plan”
  - Proposition 1A (2008)
- Why (and how) am I involved?



# California HSR: 4 stage evolution as of May 2020



# Project Evolution

(all 2017 \$ numbers are approximate)

## Evolution in Capital Costs, System Size and Demand, Revenue and Net Revenue Forecasts

(Revenue Projections for the Year 2040 re-stated in 2017\$)

Demand and Revenues are Medium Level Estimates

Business Plan	Capital Cost (\$ Billions)	Miles	Capital Cost/Mile (\$Millions)	Demand (Millions)	Gross Revenue* (\$Millions)	Net Revenue** (\$Millions)	Ratio: Net/Gross (%)	Schedule: SF to LA 3 stops
2000	20.4	442	46.1	43.8	1895.3	781.0	41.2	
2008	36.7	520	70.6	39.9	3084.6	1688.0	54.7	na
2009	39.2	520	75.4	41.0	3287.3	2062.2	62.7	2:55
2012	56.7	490	115.7	26.4	1890.0	1044.0	55.2	na
2014	56.4	490	115.1	34.9	1713.0	818.0	47.8	3:08
2016	55.3	520	106.3	42.8	2437.0	1519.0	62.3	3:10
2018	67.5	520	129.8	42.0	2561.0	1610.0	62.9	3:32
2020	76.3	520	146.7	42.0	2561.0	1610.0	62.9	3:32
* Farebox revenue plus 1% ancillary revenue								
** Gross Revenue minus O&M Costs and ongoing capital replacement								

# Identified Funding

(\$ billions)

- CA sources
  - Prop 1A: 8.5
  - Cap and Trade (2030) 11.5
  - Cap and Trade (2050) 8.2 (would require new law)
- Federal Sources
  - ARRA\* 2.6
  - 2010 appropriation\* 0.9
- Total Identified 31.7 (**versus 76.3**)
- The gap will be filled?: some private, some Federal. Could also be filled by gas tax (20 cents/gallon), sugar tax, etc.

\*Under legal threat. Note this was 2008 economic recovery still not spent

# Major Risks

(A Short List)

- Impact of Covid-19 on state and federal budgets as well as eventual demand for public transport
- Continued escalation: hard projects (tunneling, electrification, rolling stock, signaling) haven't started, delays due to unexpected problems
- Funding: need for new sources (taxes), Covid-19 impact on C&T, interaction of funding and scope.
- Realism of demand and operating cost forecasts not established

# So, What's the Problem for CA versus Other Systems?

- Prop 1A – the original sin – no constraint on unrealistic promises and no political commitment when problems arose. Failure is an orphan.
- Stable and unified leadership – policy and financial changes with political administration
- Reliable and adequate funding – never more than 1/3 actually funded, rest was “aspirational”
- Managerial capability (depth) – started with no staff, hundreds of consultants
- Valid planning and system objectives – political puffery versus actual and realistic financial and economic analysis
- Protracted litigation environment – CA has its own environmental law (CEQA) along with Federal NEPA
- Multiple jurisdictions involved: Federal, State, Local; commuters, intercity operators.

# Questions

- Could these problems with CA HSR have been foreseen and alleviated at the start?
- Can (or should) they be fixed now?