

HIGH-SPEED RAIL IN THE U.S.: THE CASE OF CALIFORNIA AND THE NORTHEAST CORRIDORS

Recitation 2

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ESD.00

HIGH-SPEED RAIL IN THE UNITED STATES



Source: Federal Railroad Administration, United States Federal Government

OVERVIEW OF CALIFORNIA HSR

Map of California HSR plan, April 2010,
removed due to copyright restrictions.

- 800 miles of track.
- San Francisco to L.A. in 2hr 40 min.
- Speeds up to 220 mph.
- Reduced greenhouse gas emissions (GHG): 12 billion lbs/ year.
- Cost
 - Construction: - \$45 billion.
 - Operating: + \$1 billion/year.
- Financing:
 - State & local: \$9.95 billion.
 - Federal
 - Public-private partnerships.

Source: California High-Speed Rail
Authority

CALIFORNIA'S POPULATION GROWTH & TRANSPORTATION NEEDS

Estimated "Door-to-Door" Travel Times in 2020

City Pairs <i>Downtown to downtown</i>	Auto <i>No project alternative</i>	Air <i>No project alternative</i>		High-Speed Train <i>Alternative optimal express times</i>	
	Total	Line Haul	Total	Line Haul	Total
Los Angeles to San Francisco	7:57	1:20	3:32	2:35	3:30
Los Angeles to Fresno	4:30	1:05	3:02	1:22	2:33
Los Angeles to San Diego	2:49	0:48	3:00	1:13	2:16
Los Angeles to San Jose	6:50	1:00	3:14	2:06	3:02
Sacramento to San Jose	2:40	No Service	No Service	0:50	1:53

Image by MIT OpenCourseWare.

Source: Highlights of the Final Program Environmental Report/ Environmental Impact Statement (EIR/EIS) for the *proposed* California High-Speed Train System, A Study by the California High-Speed Rail Authority and the Federal Railroad Administration

- By 2020:
 - 11 million more people.
 - 68 additional million trips annually.
- Alternatives to HSR:
 - Auto: 2,970 additional lane-miles on intercity highways.
 - Airports: over 90 new gates and five new runways.

CALIFORNIA: INTERREGIONAL TRIPS BY MODE

Market	Auto	Air	Rail	Total	Percent of Total
LA to Sacramento	7,479	4,935	–	12,414	1%
LA to San Diego	257,441	100	5,395	262,936	17%
LA to SF	28,031	26,867	–	54,898	4%
Sacramento to SF	137,739	25	1,816	139,580	9%
Sacramento to San Diego	175	2,858	–	3,033	0%
San Diego to SF	4,630	10,309	–	14,939	1%
LA/SF to SJV	205,205	3,393	926	209,524	14%
Other to SJV	281,750	243	344	282,337	19%
To/From Monterey/Central Coast	275,794	3,532	1,105	280,431	19%
To/From Far North	184,506	3,005	16	187,527	12%
To/From W. Sierra Nevada	59,192	668	11	59,871	4%
Total	1,441,942	55,935	9,613	1,507,490	100%
Percent of Total	95.7%	3.7%	0.6%	100%	

CALIFORNIA: MODE SPLIT IN 2030

	2000 Base Year		2030 without HSR		2030 with HSR		2030 Difference	
	Trips	Mode Share	Trips	Mode Share	Trips	Mode Share	Trips	Pct of Total
Auto	1,441,942	95.7%	2,320,567	94.5%	2,193,248	89.2%	-127,319	-71%
Air	55,935	3.7%	81,668	3.3%	53,823	2.2%	-27,845	-16%
Rail	9,613	0.6%	52,099	2.1%	31,790	1.3%	-20,309	-11%
HSR					179,482		179,482	100%
Total	1,507,490	100.0%	2,454,334	100.0%	2,458,343	100.0%	4,009	

Image by MIT OpenCourseWare.

Source: Outwater et al, "California Statewide Model for High-Speed Rail," *Journal of Choice Modelling*, 3(1), pp. 58-83.

Key terms and issues:

- Mode share
- Total traffic
- Induced demand

CALIFORNIA HSR: CURRENT CONTROVERSIES

Palo Alto Sues High-Speed Rail Authority

Joins coalition of plaintiffs including cities and nonprofit groups. Wants Environmental Impact Report rescinded, ridership forecast tossed out.

By [Aaron Selverston](#), [Vanessa Castañeda](#), and [Jamie Hansen](#) | [Email the authors](#) | October 4, 2010

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A coalition of cities and advocacy groups filed suit Monday against the California High-Speed Rail Authority, claiming that the Environmental Impact Report for the San Francisco to Central Valley segment failed to adequately address impacts and that the Authority's ridership and revenue forecasts are fundamentally flawed.

Menlo Park, Atherton, and Palo Alto joined a coalition of nonprofit organizations to demand that the EIR be rescinded.

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■ Revenue forecasts:

- Suggested that ridership forecasts are flawed, for various reasons.

■ Alignment issues:

- Environmental reviewed delayed for SF-San Jose and L.A.-Anaheim.

OVERVIEW OF THE NORTHEAST CORRIDOR (NEC)

- The Northeast Corridor (NEC) is the only “high-speed” rail in the U.S.
- Provides service for:
 - Boston-New York in 4hr 10min
 - New York-DC in 2hr 50min
- Proposed HSR improvements are costly, but they might reduce emissions from automobiles and aviation on this corridor.

Proposed Expansion or Reconfiguration of NEC Intercity Services.

Figure 3 from the Amtrak NEC Master Plan, 2010 removed due to copyright restrictions.

Source: Amtrak, The Northeast Corridor Infrastructure Master Plan

PROPOSED IMPROVEMENTS TO THE NEC

■ Service goals:

- Boston-New York in 3hr 24min
- New York-DC in 2hr 45min

■ \$52 billion capital investment over 20 years.

■ Forecasts:

- 59% increase in ridership.
- 40% increase in train movements.

Proposed Expansion or Reconfiguration of
NEC Intercity Services.

Figure 3 from the Amtrak NEC Master Plan, 2010
removed due to copyright restrictions.

Source: Amtrak, The Northeast Corridor
Infrastructure Master Plan

AIR TRANSPORTATION IN THE NORTHEAST



Photo: Scott Olson/Getty
Image courtesy of [orijinal](#) on Flickr.

- Four Northeast airports in the top 10 airports in the U.S. with worst delays:
 - JFK
 - Dulles
 - LaGuardia
 - Newark

NONLINEAR BEHAVIOR OF THESE SYSTEMS

■ Discussion Questions:

- What are some of the feedback loops in the intercity regional transportation system?
- Where might we see delays?

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