

UC Office of the President

Policy Briefs

Title

Shifting Air Travel to High-Speed Rail Could Save \$300 Million in Reduced Airport Delays

Permalink

<https://escholarship.org/uc/item/2pb3q606>

Authors

Ding, Kaijing

Hansen, Mark

Publication Date

2022-06-01

DOI

10.7922/G28W3BM3

Shifting Air Travel to High-Speed Rail Could Save \$300 Million in Reduced Airport Delays

Kaijing Ding, Ph.D. Candidate,
Mark Hansen, Ph.D., Professor

Department of Civil and Environmental Engineering, University of California, Berkeley

June 2022

Issue

California High-Speed Rail (HSR) is a publicly funded high-speed rail system currently under construction in the state. According to the California High-Speed Rail Authority (CHSRA)¹, service on the initial 119-mile segment from Madera to Bakersfield is projected to begin in 2029. The full Phase 1 will later connect Anaheim and Los Angeles with San Francisco via the Central Valley in 2033. The ride between Los Angeles and San Francisco will cover a total distance of 380 miles and take 2 hours and 40 minutes.

Caltrans' 2021 Interregional Transportation Strategic Plan², makes HSR the state's highest transportation priority for the San Francisco Bay Area — Los Angeles corridor. Quantifying its public benefits are difficult but include reducing traffic demands on California's roads and airports.

The CHSRA estimates the state could save hundreds of millions each year by avoiding making improvements to its airports that would be needed to accommodate the passenger travel that will instead be handled by HSR. We recently assessed the prospects of building HSR from a different angle — namely annual consumer cost savings from reducing airport flight delays — and found that HSR will result in nationwide savings of up to \$400 million by relieving congestion at major California airports.

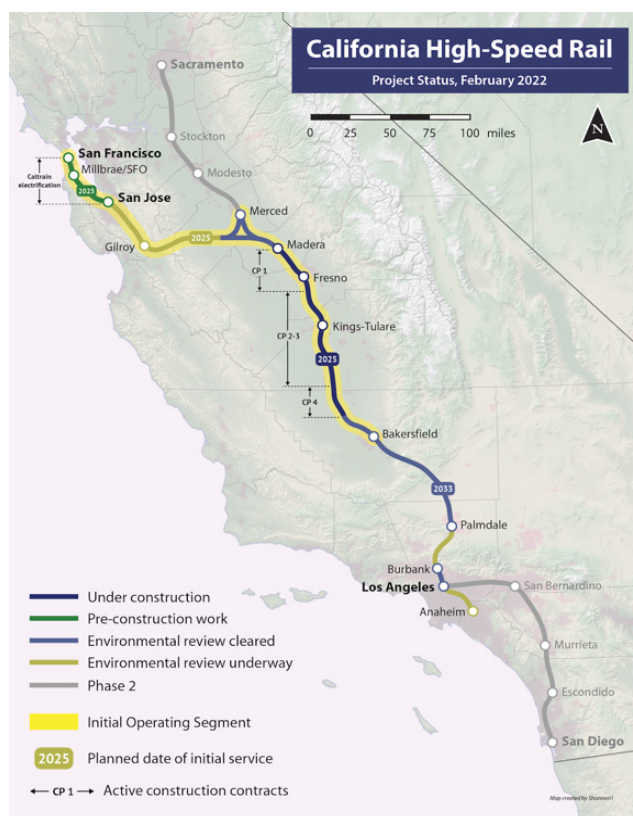


Figure 1. CAHSR Project Status as of February 2022³

Table 1. Comparison of Costs and Benefits of HSR Estimated Using Alternative Methods (Million 2018 Dollars)

	Low	Base	High
Annualized High-Speed Rail – Phase 1 Construction Cost	\$1,175	\$1,492	\$1,828
Annualized Equivalent Airport Capacity Construction Cost	\$392	\$504	\$634
Annual Airport Delay Savings in 2033	\$235	\$306	\$392

Key Research Findings

The estimated annual value of airport delay savings in California reaches about \$300 million by 2033. The study estimates nationwide airport delay cost savings of \$51-88 million (2018 dollars) in 2029 and \$235-392 million (2018 dollars in 2033). This alone amounts to about 20% of the annualized estimated HSR construction cost and over half the estimated airport construction cost savings (see Table 1).

Delay reduction benefits depend significantly on actual rail ridership which is highly unpredictable. There is a threefold difference between the potential savings between the lowest and highest HSR ridership projections (10% and 90% quantiles) in the CHSRA Business Plan.

More congested airports may experience more delay savings due to HSR. San Francisco Airport (SFO) has both the highest delay savings per flight and the largest variability of delay savings, Los Angeles Airport the second most, and San Diego the least. These findings reflect each airport's respective baseline levels of congestion and delay.

Airport delay savings, while concentrated in California, spill over to the rest of the nation. Total nationwide delay

savings for all arriving flights is 50% greater than those for these three major California airports combined since many other airports can be impacted by flights departing the state airports due to late arriving aircraft, crews, and so on.

There is wide variability in delay savings from day to day. At the high end at SFO, delay reductions from HSR could exceed 28 minutes per flight on heavily congested days when there are a high number of flight delays and cancellations, though most days it should be closer to zero. On these busy days backups can be substantially reduced by eliminating just a relatively small number of flights by diverting passengers to HSR.

More Information

This policy brief is drawn from the report “Assessing Benefits from Shifting Passenger Travel from Air to High-Speed Rail in California” prepared by Kaijing Ding and Mark Hansen with the University of California, Berkeley. The report can be found here: <https://www.ucits.org/research-project/2021-25/>. For more information about findings presented in this brief, please contact Kaijing Ding at kaijing@berkeley.edu.

¹Available from: <https://hsr.ca.gov/wp-content/uploads/2022/05/2022-Business-Plan-FINAL-A11Y.pdf>

²<https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/system-planning/systemplanning/2021-itsp-oct21-a11y.pdf>

³https://commons.wikimedia.org/wiki/File:California_HSR_Project_Status.png [Accessed 7 June 2022].

⁴https://hsr.ca.gov/wp-content/uploads/docs/about/business_plans/2020_Business_Plan_2019_Equivalent_Capacity_Analysis_Report.pdf

Research presented in this policy brief was made possible through funding received by the University of California Institute of Transportation Studies (UC ITS) from the State of California through the Public Transportation Account and the Road Repair and Accountability Act of 2017 (Senate Bill 1). The UC ITS is a network of faculty, research and administrative staff, and students dedicated to advancing the state of the art in transportation engineering, planning, and policy for the people of California. Established by the Legislature in 1947, the UC ITS has branches at UC Berkeley, UC Davis, UC Irvine, and UCLA.

Project ID UC-ITS-2021-25 | DOI: 10.7922/G28W3BM3