



# THE CALIFORNIA HIGH SPEED RAIL PROPOSAL: A DUE DILIGENCE REPORT

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## INTRODUCTION

High speed rail could possibly be a valuable transportation mode. In California it might effectively serve legitimate public or environmental purposes or be a financial success. But the current proposal is untenable, based upon overly optimistic financial claims, exceedingly optimistic ridership projections, understated cost forecasts, bloated assumptions with respect to greenhouse gas emissions, insufficient attention to environmental impacts, and unachievable travel times between major markets.

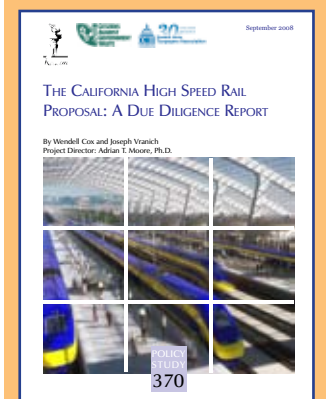
Unfortunately, the California High Speed Rail Authority's (CHSRA) activities have been overly promotional in nature, consistently presenting the proposed project in the most favorable light

and neglecting any cautionary information. CHSRA's quick adoption of the rosier ridership projections—the “high” projections—while often setting aside the “base” projections and “investment-grade” projections—is disturbing. But most problematic is the lack of independent “due diligence” analysis of the assumptions and projections of project proponents. This report is designed to provide just that.

### A Financial Boondoggle

Based upon analysis of similar systems and the California market, this Due Diligence report finds that CHSRA's ridership, revenue and cost projections are overly optimistic. The principal consequence of these findings is that the

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California high speed rail (HSR) system is unlikely to generate sufficient commercial revenues to cover its operating and capital costs.

The CHSRA has provided no convincing detailed financial assumptions and has issued contradictory statements predicting “profits” without any public justification. The CHSRA’s claims of profitability could not conceivably be credible under even the most optimistic assumptions, unless some or all capital and debt costs are ignored. This due diligence analysis indicates that the San Francisco–Los Angeles line (Phase I) alone by 2030 would suffer annual financial losses of up to nearly \$4.2 billion, with a small profit possible under only the most optimistic and improbable conditions (see Figure 1).

Such results could lead to default on private bonded indebtedness and losses for any equity investors, unless California taxpayers were to bailout private investors. There also appears to be an inevitable need for substantial additional funding from California taxpayers beyond the currently anticipated \$9 billion. Given the above, it would not be unrealistic to characterize the California HSR proposal as a boondoggle.

### Subsidies Rising

In 1999 the CHSRA estimated that the entire system would be built for \$30.3 billion. By 2005 the estimate had climbed to \$40.5 billion and by 2008 costs had risen to \$45.4 billion for only part of the system—the whole system would cost approximately \$50.2 billion (all 2006\$). Realistically based on how cost estimates have risen during the life of the project so far, total capital costs by the end of the project are likely to escalate to as much as \$81.4 billion.

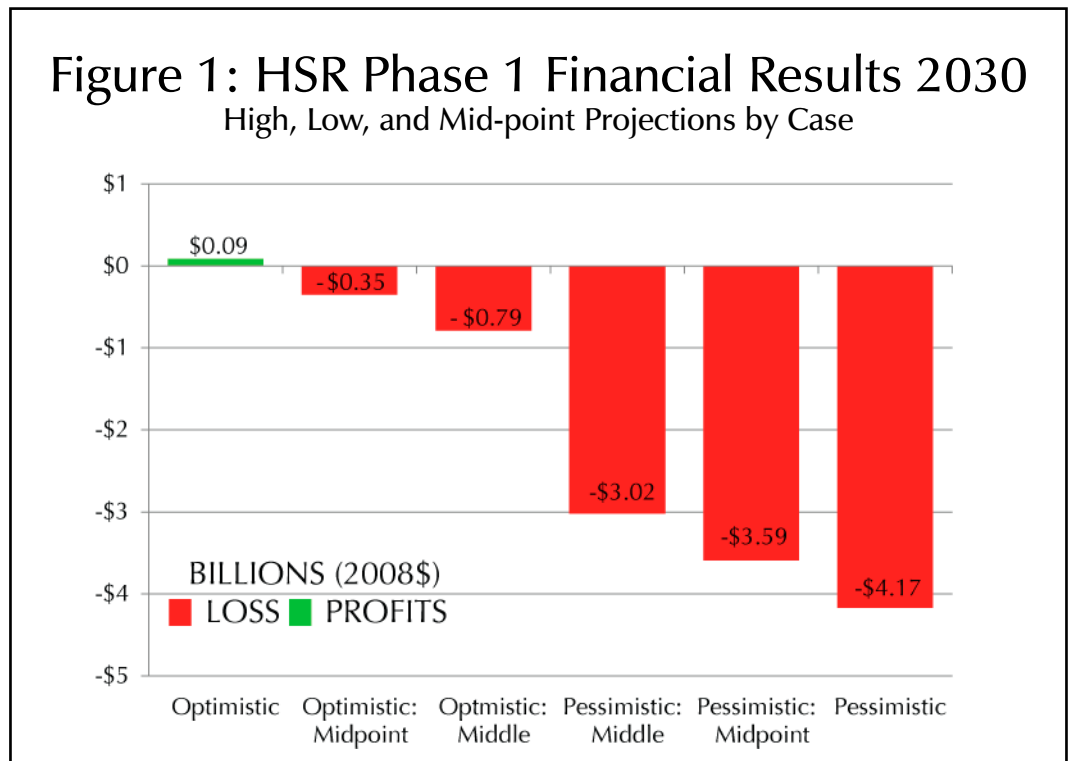
The funding program for Phase I is a hodgepodge of

highly speculative elements, relying principally on the proposed \$9 billion state general obligation bond (on the November 2008 general election ballot) and assumed \$9 billion in grants from the federal government (a figure considered highly optimistic since there is no existing federal program to provide such funding) plus private investment of up to \$7.5 billion. This leaves just Phase I at best \$7.6 billion short and perhaps as much as \$33.1 billion short. It is thus possible that not even Phase I of the HSR project is financially viable without massive funding from as-yet-unidentified government sources.

Operating costs are a major concern. CHSRA predicts operating costs from 40 to 70% below similar systems in other countries. Realistic operating costs will be 30 to 50% higher than CHSRA predicts, and much, if not all, of those higher costs will require taxpayer subsidies.

### San Diego, Sacramento, East Bay Routes Unlikely to be Built

Cost increases and the tenuous nature of major federal funding increases the difficulty of inducing private investment. There are no genuine projections that



indicate sufficient funds will be available to complete Phase II or any other phases. Already, funding plans appear to have dropped the Oakland–East Bay route.

Hence, the CHSRA may abandon plans to serve San Diego and Sacramento, the state’s third and fourth largest metropolitan areas. This would also deny service to Stockton and Modesto and to the San Gabriel Valley, Ontario, Riverside, Temecula Valley (Murrieta), and Escondido on the Inland Empire route.

### Exaggerating Ridership

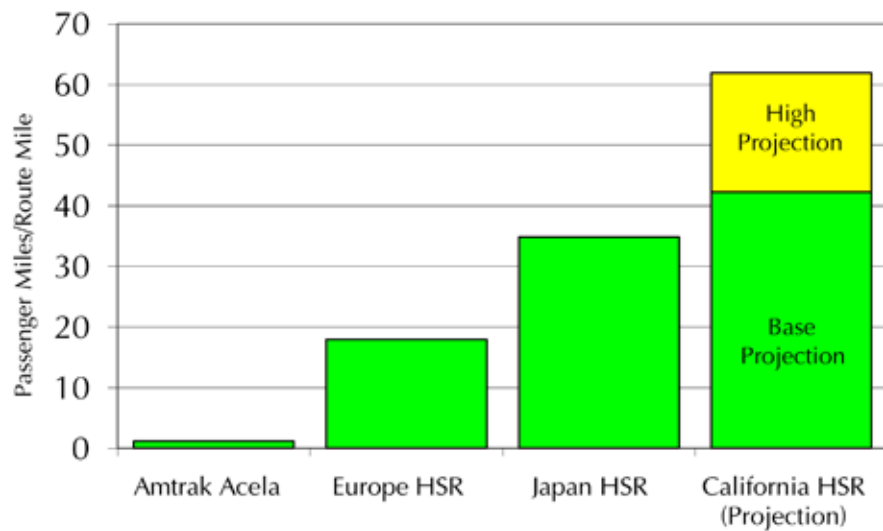
The CHSRA has been increasing forecasted ridership over time and has issued a Base Projection of 65.5 million intercity riders and a High Projection of 96.5 million intercity riders for 2030. The CHSRA ridership projections are considerably higher than independent figures developed for comparable California systems in Federal Railroad Administration (FRA) and University of California Berkeley studies.

Using generous assumptions this Due Diligence Report projects a 2030 base of 23.4 million intercity riders, 64% below the CHSRA’s base of 65.5 million intercity riders, and a 2030 high of 31.1 million intercity riders, nearly 60% below the CHSRA’s high of 96.5 million. In short, the CHSRA’s ridership projections are absurdly high.

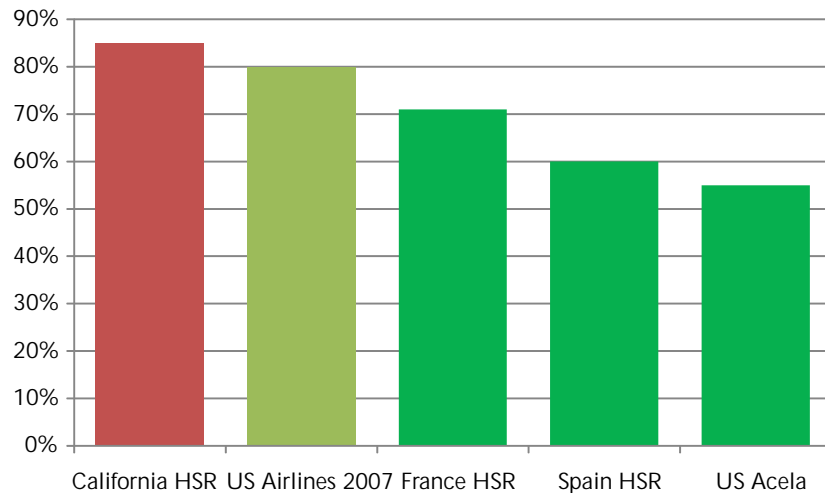
The CHSRA projects ridership intensity (passen-

ger-miles per route-mile) to be far above levels achieved on HSR systems in France, the balance of the European Union, and Japan (see Figure 2). Each of these markets is considerably more favorable for HSR and it would thus be expected that California ridership intensity would be lower. Moreover, the CHSRA’s projected load factor (share of seats filled on average) is far higher than what is found on HSR systems elsewhere around the

**Figure 2: Ridership Intensity Comparisons**  
Passenger Miles Per Route Mile



**Figure 3: California HSR Load Factors in Context**  
Compared to Airlines and Other HSR Systems



world (see Figure 3).

The CHSRA’s ridership projections rely on extraordinarily low fares that are far below current levels on other HSR systems. For example, the projected San Francisco–Los Angeles unrestricted business class fare is proposed to be \$70 in 2030 (2006\$) while today’s business class fares Tokyo–Osaka are \$135, Paris–Marseille \$140 and New York–Washington \$172. The CHSRA’s artificially low fares—unlikely to be achieved—could be a substantial element in driving the absurdly high ridership projections.

### HSR’s Marginal Impact on Greenhouse Gas Emissions

Claims about HSR’s environmental benefits center on greenhouse gas reduction through reduced CO2 emissions. The CHSRA claimed the electrified trains would remove people from other modes of travel and reduce CO2 emissions sufficient to meet “almost 50%” of the state’s total emission reduction goals. However, based upon California Air Resources Board projections, HSR would ultimately remove CO2 emissions equal to only 1.5% of the current state goal, a slight improvement (see Figure 4).

Moreover, the reality is that HSR’s impact on CO2

reduction would be very costly. The Intergovernmental Panel on Climate Change (IPCC) standard for the acceptable cost of removing CO2 is up to \$50 per ton and a recent report by McKinsey & Company and The Conference Board indicates that strategies are available for substantially reducing CO2 emissions at less than \$50 per ton. This Due Diligence Report finds that the HSR cost for CO2 reductions in 2030 (in 2008\$) would range from a low of \$1,949 (39 times the IPCC ceiling and 115 times the McKinsey average) to \$10,032 (201 times the IPCC ceiling and 590 times the McKinsey average) per ton removed.

### Slower Travel Times Than Promised

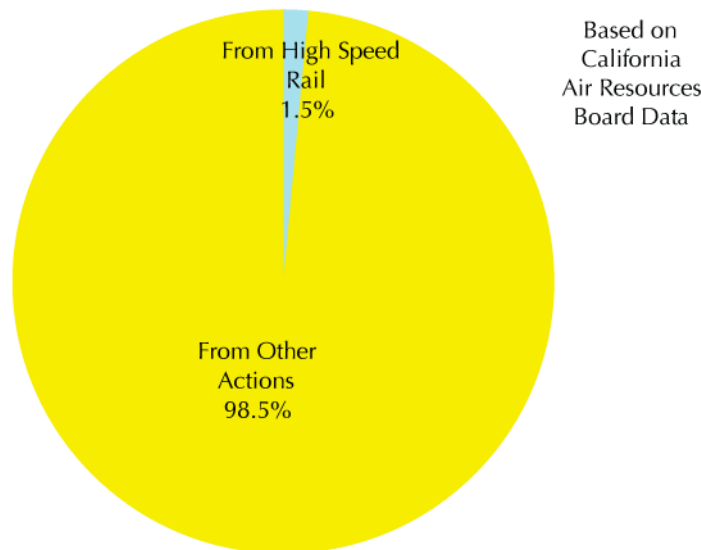
The CHSRA will be unable to meet its speed and travel time objectives. Based upon international HSR experience, realistic HSR speeds mean that a non-stop San Francisco–Los Angeles trip would take 3 hours and 41 minutes—59 minutes longer than the statutory requirement of 2 hours, 42 minutes.

The CHSRA’s anticipated average speeds are not being achieved anywhere in the world, including on the most advanced systems. CHSRA anticipates average speeds of 197 mph, while France’s TGV-Est averages 174 mph, TGV Paris–Avignon averages 159 mph,

Japan’s bullet train averages 159 mph, and Taiwan’s HSR averages 152 mph. Other HSR lines in the world average even slower speeds.

Given this reality, the limits of HSR technology, and the reality that at least 150 route miles would be in built-up areas where trains would be forced to slow down, this Due Diligence Report predicts California’s HSR average speeds in urban segments will not exceed 90 mph much less reach 150 mph. The average speed outside urban areas is unlikely to surpass 170 mph.

Figure 4: Impact of HSR on GHG Reduction Goal 2020: Using 2030 HSR Impacts





As a result, HSR will be less attractive as an alternative to airline travel and is likely to attract fewer passengers than projected. It is also likely that HSR door-to-door travel times would be greater and there would be considerably less frequent non-stop service than air service.

### Exaggerating Highway and Airport Costs: The “Alternatives”

The CHSRA argues that building HSR will divert many riders from the highways and airlines and thus reduce the state’s need to build more highway and airport capacity. The CHSRA estimates the costs of building new road and airport capacity, what they call Highway and Aviation Alternatives to HSR, at \$82 billion; the HSR planners attribute \$66 billion in such costs as savings resulting from building HSR.

The \$82 billion estimate is highly exaggerated. This Due Diligence Report estimates that with realistic estimates regarding highway construction costs and diversion of drivers, HSR could reduce highway construction needs by approximately \$0.9 billion. Regarding aviation, evidence shows that strong air markets remain and flight frequencies stay high in Europe and Japan after HSR corridors are in operation. HSR will not appreciably reduce the need for airport expansions in California.

### No California-Style HSR Train Meets U.S. Safety Standards

It is possible that a maximum train speed of 220 mph can eventually be achieved in California. However, the CHSRA does not have a usable train design that can reach such a speed that also is authorized to operate in the United States.

High-speed rail has an excellent safety record overseas, but conditions here are different. Here, the CHSRA’s trains will share tracks with freight trains and commuter trains that are heavier than are found overseas. Such “mixed” operation means that federal safety standards require HSR trains to be at least twice as strong—and as a consequence heavier—than overseas trains to better survive collisions. Moreover, the

CHSRA has conducted studies based on five different passenger-carrying capacities ranging from 450 seats per train to 1,600 seats per train, and the ultimate design will affect the HSR train’s weight and size in significant ways.

No existing overseas HSR train capable of meeting the CHSRA’s speed and capacity goals can legally be used because no such train meets federal crashworthiness standards. It is likely that a series of designs, tests, prototypes and safety reviews never before achieved anywhere in the world must succeed for the CHSRA train to become a reality. Train design uncertainties justify calling into question the accuracy of CHSRA projections regarding travel times, ridership and revenues, energy requirements, GHG emissions, noise generation, capital and operating costs, and overall system financial performance.

### Previous U.S. High-Speed Rail Failures

Recent years saw planning for HSR systems begin in three states—California (for Los Angeles–San Diego), Texas and Florida. All projects were cancelled because of cost escalations, exaggerated ridership projections, and credibility problems with state agencies and train promoters. In each instance various taxpayer-reliant proposals were put forth to support HSR, such as using state bonding authority and tax-free bonds, surcharges on automobile license tags, increases in the motor fuel tax, calls for greater operat-



ing subsidies and government guarantees.

Other reasons for public displeasure also existed. In Florida, environmentalists' dissatisfaction grew over breaches of promises to protect water supplies. In Texas, rural opposition developed because of a belief that the use of eminent domain would harm farmers and ranchers. Their biggest concern was "landlocking," when the high-speed track splits a ranch or farm in two and the owner is unable to easily move between sections—the CHSRA calls such land-splitting "severance."

In California, an earlier plan to run Los Angeles–San Diego trains at a profit was met with skepticism on Wall Street, and the project collapsed when five communities—San Diego, Del Mar, Carlsbad, Oceanside and Tustin—filed a lawsuit based on environmental issues. The city of Tustin contracted for an analysis of projected ridership and costs that discredited overly optimistic estimates. Federal reviewers concluded that commuter and short-trip travel—the greatest cause of traffic problems—would continue despite HSR and that ultimate energy savings could be insignificant.

Public and political opposition caused investment community interest in the Southern California plan to evaporate. Indeed, this appears to have portended the type of potential "political meddling" that CHSRA consultant Lehman Brothers cited as a current risk in investor documents. Some opposition to the CHSRA plan is emerging and is likely to spread as site-specific urban, suburban and rural impacts become better understood. It is unlikely that the HSR program will find smooth sailing among impacted communities.

### Inappropriate Comparisons with Other Systems

The federally sponsored HSR program for the Northeast Corridor, Boston–New York–Washington, serves only a fraction of its projected ridership. The route has the nation's highest population density—far greater than California's—and provides HSR ridership that is but a fraction of the intensity of the Japanese and European systems.

This Due Diligence Report compares the CHSRA's proposed system with major overseas systems. Cali-



ifornia is proceeding with HSR plans based on assumptions that are appropriate to European and Asian environments but hold little applicability here where conditions are far less favorable. Overseas HSR systems serve shorter distances between major urban areas, greater population densities on smaller land areas, denser central business districts, and rail "hub" traffic patterns. They also link to far more connecting transit services and have historically strong rail markets that provide a ready pool of riders that have transferred from slower, conventional services to the HSR services. California lacks these advantages.

The commonality of all of this experience is that HSR has yet to be demonstrated as a commercially viable venture in the United States. There is no documentation meeting U.S. generally accepted accounting principles demonstrating that overseas HSR systems have covered their operating and capital costs without subsidies. Such a determination with respect to the California HSR proposal would be a minimum due diligence finding.

## DUE DILIGENCE CONCLUSION

The CHSRA planning process has included misrepresentations, inconsistencies and over-promotion, while spending \$58 million in a flawed planning process.

Even a strong HSR advocate, former Senate President and former CHSRA board member, James R. Mills, is reported to have “described the entire project as ‘based on a fallacy’ of wildly exaggerated ridership projections.” California HSR as proposed is likely to fail to achieve virtually all of the projections that are crucial to success. It is likely to be a money loser. It is likely to carry far fewer passengers than projected. It is unlikely to be able to meet its aggressive travel time requirements. It will fail to make a significant reduction in greenhouse gas emissions while costing many times the international IPCC ceiling of \$50 per ton removed.

The CHSRA’s analysis of the proposed HSR system is insufficient and inaccurate; cost estimates are outdated and ignore substantial cost drivers; ridership projections are highly inconsistent with international experience and California market characteristics; risks are understated or ignored; assurances of profitability lack credibility; and statements about future taxpayer subsidies are misleading and contradictory.

Senator Alan Lowenthal, Chairman of the Senate Housing and Transportation Committee posed the question: “What assurance can the Authority provide that California taxpayers will not be stuck with a massive bill in the future?” The answer is “none.”

## ABOUT THE AUTHORS

**Wendell Cox** is principal of Demographia, a St. Louis region-based public policy firm. He was appointed to three terms on the Los Angeles County Transportation Commission, where he authored the *Proposition A amendment* (1980) that established local funding for the light rail and metro lines. He was also appointed to the Amtrak Reform Council to complete the unexpired term of New Jersey Governor Christine Todd Whitman. There, he was instrumental in forging the final financial self-sufficiency plan that was required by the U.S. Congress.



He has worked on numerous projects in the United States and internationally. He authored the 1997 James Madison Institute evaluation of the proposed Florida high-speed rail system and subsequent report. His analysis of the proposed Las Vegas Monorail contained accurate ridership projections, in contrast to the project-sponsored “investment grade” projections that were more than double the eventual ridership. His prediction that the Las Vegas system would ultimately be unable to service its bonded indebtedness has now been repeated by Wall Street analysts. His 2000 commentary in the *Apple Daily*, Hong Kong’s largest newspaper, argued for vigorous expansion of that urban area’s rail system.

Demographia’s “Public Purpose” website ([www.publicpurpose.com](http://www.publicpurpose.com)) was designated twice by the *National Journal* as a “Top Transport Internet Site.”

**Joseph Vranich** has been involved in rail passenger issues for more than 35 years. He has advocated building high-speed train systems through public-private partnerships and served as President/CEO of the High Speed Rail Association in the early 1990s, where he won the Distinguished Service Award. He has testified numerous times before the U.S. Congress on high-speed rail and Amtrak—including support for Amtrak’s high-speed Acela program. Early in his career he served as an Amtrak public affairs spokesman.



He has spoken internationally at the invitation of Japan’s Ministry of Transport, Japan’s Railway Technical Research Institute, European railway suppliers, and addressed a visiting Chinese government delegation on railway reforms in comments that were published in *Vital Speeches*.

He is the author of *Supertrains* (St. Martin’s Press, 1991), a significant public policy book advocating construction of HSR systems in the United States; *Derailed: What Went Wrong and What to do About America’s Passenger Trains* (St. Martin’s, 1997), and *End of the Line: The Failure of Amtrak Reform and the Future of America’s Passenger Trains* (AEI Press, 2004).





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