

High speed rail essential to keep California on track

Trains offer best bet for fast, clean transport as state grows

by Stuart Cohen and Carli Paine

Building high-speed rail in California could reinforce cities as the hubs of our economies, significantly reduce greenhouse-gas emissions, get commuters off congested roads, and will cost much less than highway and airport expansion. So why is the proposal languishing?

There are many complicated reasons, but a few are very clear. Term limits force many of the project's champions from office, the time frame is too long for election-cycle ribbon-cutting ceremonies, and an ongoing structural deficit is forcing the state to prioritize short-term infrastructure fixes.

Though considered down and nearly out by some prognosticators, the high-speed rail project is gaining supporters and momentum daily. An awareness of the train as a critical greenhouse-gas-reduction strategy is growing. Recent ridership projections should attract private investors to complement state, federal and local funding, making the project more economically sustainable. Finally, people are starting to understand that we cannot build our way out of congestion with more highways.

This article describes California's proposed high-speed train system and its latest ridership projections, an analysis of greenhouse-gas benefits, land-use impacts, and the high environmental and financial costs of the alternatives.

Project overview

In the mid-1990s, state leaders were increasingly cognizant of the capacity limits of highways and

airports. Inspired by the stunning success of high-speed trains in Japan and Europe, California began exploring how a high-speed rail system linking the major metropolitan areas could cost-effectively sustain the state's mobility and economic growth while reducing the environmental impact of travel.

In 1996, the California High-Speed Rail Authority was established to implement a high-speed train system connecting California's major metropolitan areas. By 2000, the authority had developed forecasts of ridership, revenue and costs for a 700-mile system with nearly 30 stations connecting Sacramento, the Bay Area, the Central Valley, and the major cities and some airports in Southern California.

Recent 2007 forecasts show the system carrying up to 117 million passengers per year by 2030, with an expected trip from San Francisco to Los Angeles taking about two and a half hours. A shorter distance, from San Francisco to San Jose, would take about half an hour.

Applying inflation to the year 2000 cost estimates puts a \$40 billion price tag

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Image courtesy Keith Pomakis

Japan's Shinkansen is well known for providing swift and efficient transportation. What is less well known is that the trains also feature comfortable and relatively luxurious seating accommodations.

on the system as a whole. But since the project would be constructed in segments, it would also provide public benefits such as grade separations and track upgrades even before the entire system is completed.

terminate the project. By backing this project, Schwarzenegger has a crucial opportunity to achieve the tremendous benefits of greenhouse gas reductions and more sustainable land use. His support is essential to move this train forward.

On and off the ballot

A \$9.95 billion bond to get the system started was placed on the 2004 ballot but it was pulled due to the lackluster economy and the need to resolve some issues, such as route selection. In 2006 the bond was pushed back to 2008, this time because of the record \$43 billion in bonds on the ballot for projects that Gov. Arnold Schwarzenegger made a priority.

Last year, with support from state Sen. Don Perata and others, the project got a tremendous boost. The authority received funding to begin detailed environmental studies and preliminary engineering work needed to construct the system. Recently, the authority submitted a \$103 million request to the Legislature. This request would continue the environmental studies and purchase key right-of-way lands that are threatened with imminent development.

California's legislative analyst is recommending that the state either fully fund the request or just






The decision over the route into the Bay Area looms large, and has become an incredibly polarized and politicized issue.

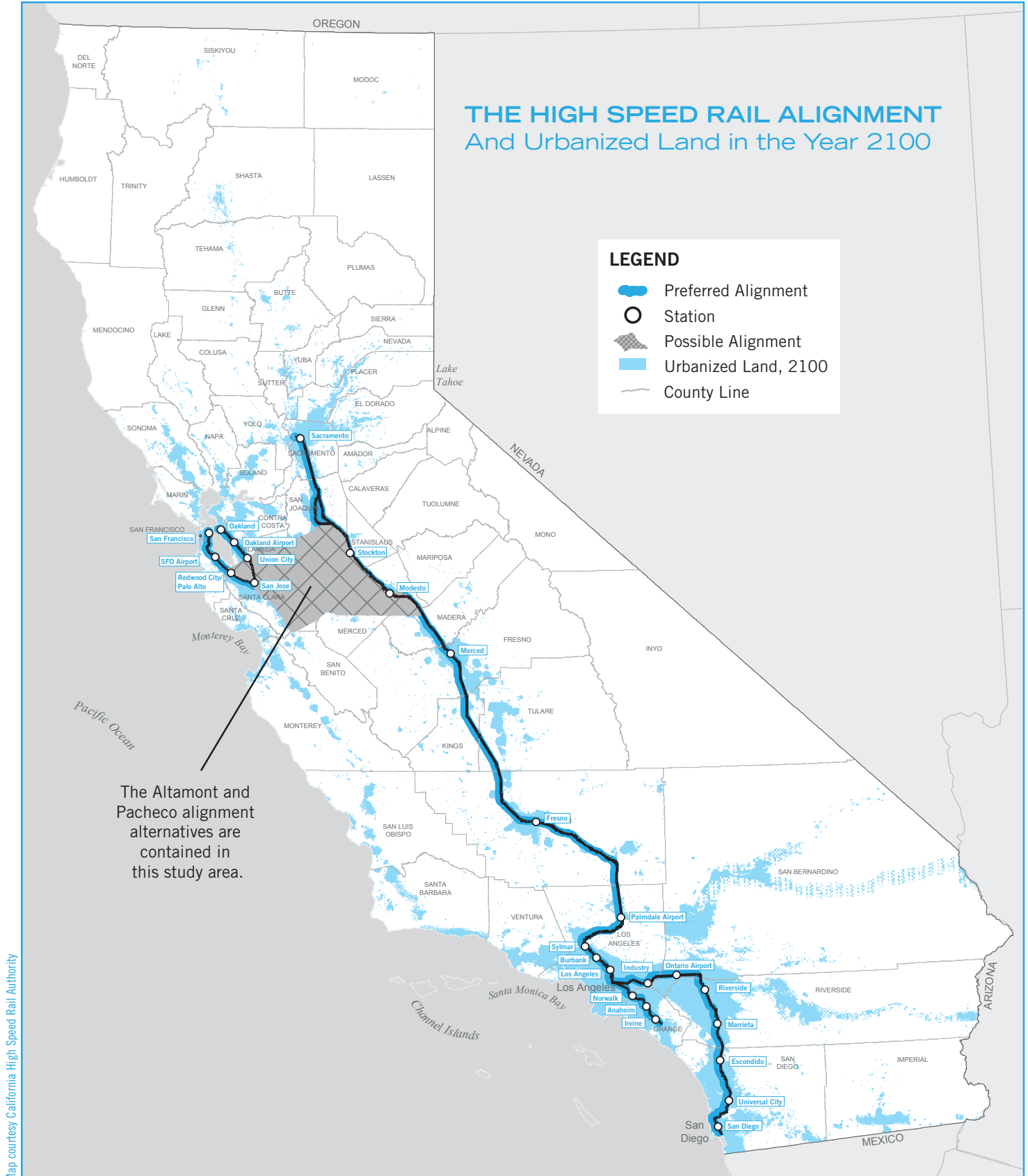
Building on worldwide experience

Beginning in 1964 with the Tokyo–Osaka bullet train (known there as the Shinkansen), Japan proved that high-speed trains could provide major transportation capacity and deliver significant operating profits. Today, the Shinkansen carries more than 300 million passengers a year.

THE HIGH SPEED RAIL ALIGNMENT And Urbanized Land in the Year 2100

LEGEND

-  Preferred Alignment
-  Station
-  Possible Alignment
-  Urbanized Land, 2100
-  County Line



The Altamont and Pacheco alignment alternatives are contained in this study area.

Map courtesy California High-Speed Rail Authority

A high-speed rail system connecting Northern California and Southern California is essential to the state's economy, ecology and quality of life. However, considerable disagreement remains regarding the question of the path the system takes in Northern California. One possibility would bring trains to the Bay Area via the Pacheco Pass and Gilroy, while another would head west to the Bay Area over the Altamont Pass.

The blue-colored shading indicates the area projected to be urbanized land in the year 2100. These projections, done by John Landis, largely follow the highway infrastructure in the state. In this map, we have shown the high-speed rail alignment on top of the urbanized land to show the potential for using high-speed rail as an armature to organize the state's growth over the next century. In reality, the urbanized land area will be different, and less sprawling, if we build the rail network.

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In Europe, the first commercial high-speed train began operating in 1981. With the addition of new lines in Italy, France and Germany, and the construction of high-speed lines in Spain, England, Belgium and the Netherlands, more than 2,550 miles of high-speed lines have been completed in Europe. The technology is now spreading to Taiwan, Korea, China and Mexico. The United States — and cutting-edge, but crowded California — are being bested by developing countries.

These trains aren't just fast; they are comfortable and convenient. The ride is smoother than that on commuter rail and subways. Typical high-speed trains have specialized cars with reservable rooms for business meetings, dining cars, entertainment cars, and cars with special activities and accommodations for families with children. And with stations in existing downtowns, traveling to the train can be quick and convenient.

High-speed rail presents the opportunity for California to have the first truly zero-emission high-speed train system in the world.

California's high-speed trains will use state-of-the-art electrified vehicles capable of speeds of up to 220 mph, similar to those currently operating in Europe and Asia. The line will consist of new infrastructure often in or alongside existing transportation corridors. The entire high-speed train system will run at a different elevation from that of parallel and crossing roads. Designed in coordination with the state's existing public transit network the trains have the potential to share tracks at reduced speeds with conventional trains such as Caltrain and will act as a strong feeder system to urban transit systems.

The Bay Area connection

The decision over the route into the Bay Area looms large, and has become an incredibly polarized and politicized issue. There are two basic alignments: a southern one along the

Pacheco Pass and a northern one along the Altamont Pass. The Pacheco Pass alternative would travel west from Madera, connect with Gilroy and travel north along Highway 101.

The Altamont Pass alternative would travel north from Madera through Merced and Modesto and then head west over the Altamont Pass into the Bay Area. The authority is looking at a variety of options as to where the train will terminate and how it will be integrated with existing transit systems.

The authority is undertaking an environmental study, focused on selecting a preferred alternative between the Central Valley and the Bay Area. In doing so the authority is responding to two regional and local concerns. First, the authority is studying routes over the Altamont pass, as well as the Pacheco Pass, and is participating in a larger Bay Area regional-rail study. Second, the authority screened out routes through and just north of Henry Coe State Park and other highly sensitive habitat areas. This document should be in circulation by June 2007.

Making the land use link

The development of a high-speed train linking California's major cities to each other could help retain existing downtowns as the primary economic centers of California and provide mobility for the state's growing population. But as was learned from BART's early years, good land use does not automatically follow new transit; policies must be in place to link investments in the high-speed train with supportive land use.

A recent study by the Metropolitan Transportation Commission found that people who both live and work within half a mile of rapid transit use transit for 42 percent of their work trips.¹ Those who neither live nor work near transit use transit for only 4 percent of their work trips. Building housing near transit stations will increase ridership by making transit convenient and accessible.

The High Speed Rail Authority has already made what is arguably the most critical land-use decision, focusing new stations primarily in downtowns at existing transit hubs. Even though it can cost more to go through city centers in areas such as the Central Valley, the authority made a policy decision to avoid locating stations in undeveloped areas.

The authority is also looking at strategies used

¹ *Characteristics of Rail and Ferry Station Area Residents in the San Francisco Bay Area: Evidence from the 2000 Bay Area Travel Survey*, Volume 1, p. 1. MTC, September 2006.

in the Bay Area by BART and the Metropolitan Transportation Commission to require that ridership support or station area plans be in place before the authority commits to finalizing station locations. The principles that they will require include:

- Higher-density development in relation to the existing pattern of development in the surrounding area, along with minimum requirements for density.
- A mix of land uses (retail, office, hotels, entertainment, residential, etc.) and a mix of housing types to meet the needs of the local community.
- A grid street pattern and compact, pedestrian-oriented design that promotes walking, bicycle and transit access.
- Context-sensitive building design with new buildings designed in relation to streets, plazas, other open space areas and parking structures.
- Limits on the amount parking for new development and a preference for parking placed in structures. Sufficient parking for train passengers would be essential to system viability, but this would be offered at market rates to encourage the use of access by transit and other modes.

The authority is now working to further define land-use policies. Research in this area will be conducted by a team led by Prof. Elizabeth Deakin at the University of California at Berkeley. One important issue will be how to complement

better urban development with policies to protect open space. Many people believe that open-space strategies can only work if the authority requires countywide policies. This is one of the issues that will be tackled over the next year.

California high speed rail and greenhouse gas reductions

California is the 12th-largest source of greenhouse-gas emissions in the world, and 41 percent of the state's emissions come from the transportation sector. California's landmark legislation, Assembly Bill 32, requires greenhouse gases to return to 1990 levels by 2020 and to drop to a point 80 percent lower than 1990 levels by 2050.

However, cleaner fuels and more-efficient vehicles alone are not anticipated to meet AB 32's requirements: While cars are getting more efficient, the total number of miles automobiles travel yearly is increasing so much that it more than cancels out the benefits of cleaner fuel and more-efficient cars. We need to complement fuel and vehicle efficiency with a wide range of strategies to reduce the number of cars on the road.

A national study conducted last year found that a California high-speed train system had tremendous greenhouse-gas reduction potential. In fact, building a system in California would reduce emissions more than the reductions from nine other major regions including Texas, Florida and



The California High-Speed Rail Authority has decided to site new stations mostly at existing transit hubs in downtowns, a decision likely to have a positive impact on ridership and land use. People who live and work within half a mile of rapid transit use it for nearly half of all their trips.

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European high-speed rail got its start in 1981, and there now are thousands of miles of track among several countries. The ride on these trains is smoother than on commuter rail and subways, and trains often include rooms for business meetings, entertainment and dining.

the Northeast — combined. By displacing some in-state airplane trips to the electricity-powered high-speed train, the project would result in substantial emissions reduction, especially given that the Los Angeles to San Francisco corridor is the most highly-trafficked air corridor in the world.

Preliminary calculations indicate that by 2030 the California High Speed Rail system could reduce greenhouse-gas emissions by more than 8.7 million metric tons annually when compared to the effect of expanding road and airport capacity by a similar amount.²

Additional emission reductions could be achieved by running the system on clean energy and implementing companion land-use policies. Higher costs of air and car travel may encourage more people to ride the high-speed train as an alternative.

To put these numbers into context, AB 32's goal includes 18 million metric tons of emission reductions targeted from smart land-use and intelligent transportation systems.³

High-speed rail presents the opportunity for California to have the first truly zero-emission high-speed train system in the world. Given the state's potential for generating clean power, running the entire system on clean, renewable energy would be feasible and would not significantly increase the ongoing costs for the project.

Alternatives to high speed rail: highway and airport expansion

In the Transportation and Land Use Coalition's discussions with organizations around the state about the proposed high-speed train, two primary concerns emerged: the price of the system and its impact on habitat. Many of these groups developed questions and concerns in response to the program-level environmental-impact report several years ago. While these are major concerns, they should be considered in relation to the alternatives.

It is anticipated that California is going to be a state of 50 million to 60 million people in the next 25 to 45 years. There undoubtedly will be a growing need to accommodate the growing travel demand. When we don't provide access to effective transit, the demand for highways and airports surges.

The environmental footprint of new highways is tremendous, and widening existing roads requires large new interchanges and expanded feeder roads. In contrast, a high-speed rail system will largely rely on existing rail corridors.

When we consider spending public dollars on the high-speed rail system, we must weigh this project against the costs of alternatives. For example:

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2 Calculations include assumption of reductions of 30 percent increase in fuel economy by 2030, as per California law (Assembly Bill 1493, Pavley) and CO2 reduction estimates from Table S-6.1, *Summary of Key Environmental Impacts and Benefits for System Alternatives in the California High-Speed Train Final Program EIR/EIS*, March 2007 ridership projections allow for 2030 extrapolations.

3 California's total emissions reductions by 2020 are intended to be approximately 174,000,000 metric tons. Recent HSR projections go to 2030.

HIGH SPEED RAIL'S IMPACT ON GREENHOUSE GASES

Estimated reduction in annual emissions per year by the year 2030

High-Speed Rail, 2030	Annual Greenhouse Gas Reductions ⁴ (metric tons/year)	Equivalency: Cars off the Road/Year ⁵
Baseline Project	8.7 million	1.88 million
With clean, renewable electricity	8.87 million	1.91 million
With higher ridership due to higher cost of air and car travel	11.9 million	2.57 million

⁴ Calculations include assumption of Pavley reductions of 30 percent increase in fuel economy by 2030 and CO2 reduction estimates from Table S-6.1, Summary of Key Environmental Impacts and Benefits for System Alternatives in the California High-Speed Train Final Program EIR/EIS. March 2007 ridership projections allow for 2030 extrapolations.

⁵ U.S. Climate Technology Cooperation Gateway calculator: <http://www.usctcgateway.net/tool/>

Source: Transportation and Land Use Coalition

If California builds even a minimal high-speed rail system, use of rail transport instead of air and automobile travel could produce significant reductions in the amount of greenhouse gases emitted per year. If trains are powered by clean sources of electricity, or if large numbers of people turn to high-speed rail as an alternative to higher costs of air and auto travel, estimated emissions reductions would be even greater.

- Caltrans estimates it will cost about \$6 billion (2006 dollars) to widen Highway 99 from four lanes to six. Meeting interstate requirements and widening to eight lanes is estimated to cost between \$20 billion and \$25 billion.⁶ Demand for this project is intense: It was the only project earmarked in the recent state transportation bond measure.
- The California Transportation Commission identified \$28.5 billion in high priority highway expansion projects for a 10-year period. Over two-thirds of these dollars are needed for projects in the Bay Area, Los Angeles, San Bernardino, San Diego, and Riverside — all areas that would be served by high-speed rail.⁷
- The cost of all construction in the Los Angeles International Airport Master Plan are estimated to come to \$11 billion.⁸

In a state as built-up as California is, with tremendous land values, providing any kind of additional mobility is going to be expensive. The high-speed train costs less than half what highways would for the same capacity.

The high-speed train project offers a unique opportunity for air quality and mobility benefits, transit-oriented development potential, and reduced greenhouse-gas emissions. Most groups, including many members of the Transportation and Land Use Coalition, want to see a full plan

before supporting funding in 2008 to build the the project. Given the tremendous potential benefits, there is an urgent need to get the authority the requested \$103 million in the coming year's budget. These funds will help carry out the detailed environmental review needed to obtain the permits necessary for construction, and to acquire at-risk right of way critical to the system.

As we allow more time to pass, the high-speed rail project becomes more and more expensive, especially in terms of rights-of-way and construction costs. This is likely our last chance in a generation, or more, to move ahead with this fast and environmentally sustainable alternative. *

By Stuart Cohen, executive director, and Carli Paine, transportation program director, of the Transportation and Land Use Coalition. TALC has been hired by the California High Speed Rail Authority to spearhead outreach to environmental and social-justice organizations across the state. Input from these groups is being used to help shape strong land use policies, and ensure that all communities benefit from the project. SPUR is a member of TALC.

⁶ *Route 99 Corridor Enhancement Plan: Unifying the Aesthetic Treatment of Highway Improvement.* Caltrans (2005). <http://www.dot.ca.gov/dist6/99masterplan/index.html>.

⁷ *Inventory Of Ten Year Funding Needs for California's Transportation System.* California Transportation Commission (1999). Total cost adjusted to reflect 2007 dollar value.

⁸ *About the Program: Frequently Asked Questions.* Master Plan LAX. <http://www.laxmasterplan.org/>.