UNLEASH PROSPERITY

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California High-Speed Rail

Still Stuck at the Station

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Executive Summary

> **"... there is no reason to conclude that the Authority's problems on the project are over."**
>
> California High-Speed Rail Peer Review Group, 2023

California's high-speed rail project is seriously troubled. Originally envisioned to connect the state's major metropolitan areas, the project has been mired in delays, massive cost overruns, and an uncertain future.

Initial Plan: Planning for a San Francisco to Los Angeles high-speed rail line started in 1996, with a cost estimate of $20 billion (1999). In 2008 a state referendum authorized funding for Phase I (San Francisco to Los Angeles and Anaheim), which was to cost $33 billion. The plan also included extensions to Riverside-San Bernardino, San Diego and Sacramento (Phase 2).

Current Reality: The first segment, in the Central Valley between Merced and Bakersfield is projected to open by 2033. The full Phase I project, which would extend service from Merced to San Francisco and Los Angeles to Anaheim has up to a $100 billion funding gap, and faces likely prospects of considerable additional cost escalation. Without sufficient funding for Phase I, there is no adopted completion date.

California High Speed Rail Authority (CHSRA) ridership projections for a completed Phase I are more than double the ridership carried on the Amtrak Northeast Corridor trains, despite the fact that the California markets to be served have one-half the population.

International research indicates that "optimism bias" can occur in high-speed rail planning, wherein costs are substantially underestimated, while ridership and revenue tend to be overestimated. With respect to construction costs, which have already begun, this is evident on the California high-speed rail line. Indeed, the cost escalation to come, in the San Francisco and Los Angeles extension to the Central Valley segment, could raise the funding gap even more, because the terrains are far more challenging, with lengthy tunnels and more challenging topography.

There is no completion date for Phase I, due to the lack of funding. With this reality, there is also no completion date for Phase II.

Policy Recommendations: Based on the analysis, the following recommendations are proposed:

- Finish only the 119-mile Madera to Shafter segment, halting work on further extensions.
- No further public expenditure on Phase I Bay Area/Los Angeles extensions or Phase II (Riverside-San Bernardino, San Diego and Sacramento).
- There should be no further federal funding for California high speed rail.

1: History of the Project

This report examines the history, situation and prospects for the California High-Speed Rail System. Nearly three decades ago (1996), the California High-Speed Rail Authority (CHSRA) was established by state law to oversee the planning, development and operation of a high-speed rail system. Much of this analysis deals with cautions indicated by the legislatively created high-speed rail Peer Review Committee, the California Legislative Analyst (LAO) and the high-speed rail Inspector General, an independent office established by the legislature in 2023.

Phase I, from San Francisco to Los Angeles, was to be completed by 2020. Top train speeds would be at least 200 miles per hour, while minimum travel times were not to exceed 2 hours and 40 minutes between San Francisco and Los Angeles. Train frequencies were to be at least every five minutes. Phase II would extend the system to Riverside-San Bernardino, now the state's second largest metropolitan area, having recently displaced San Francisco. Phase II was to have also extended to San Diego (the fourth largest metropolitan area) and Sacramento (the fifth largest metropolitan area), for an overall length of about 800 miles.

This report covers the project from the beginning to the *2024 Business Plan.*

1.1: Phase I and II Planning: 1996-2008

From the beginning, the principal challenge was financing the system. Proposed bond elections for high-speed rail were delayed four times in the early 2000s.[1] Finally, in 2008, Assembly Bill 3034 was enacted, providing the framework for a bond referendum on the November ballot.

The bond issue (Proposition 1-A), to raise $9 billion of the $33 billion cost of Phase I (San Francisco to metropolitan Los Angeles) was approved by a 52.6% to 47.4% majority of the state's voters.

Earlier in 2008, Joseph Vranich and I authored the first major independent analysis of the California High-Speed Rail project ("The California High-Speed Rail Proposal: A Due Diligence Report").[2] Based on a review of US and international experience, we predicted that Phase I could not be built for the $33 billion and that huge cost overruns were likely. We concluded that: "The principal message … is that CHSRA's plans have little or no potential to be implemented in their current form and that the project is highly risky for state taxpayers and private investors." In reality, our analysis was too conservative, as costs exceeded our cost escalation projection in less than five years.[3]

We suggested that rising costs could force down-scaling to a "skeletal system" that would operate over commuter rail tracks (conventional, not high speed) in parts of the Bay Area and metropolitan Los Angeles. In 2012, CHSRA adopted a "blended" system similar to our skeletal system (Section 1.2).

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1 "California Proposition 1, Bonds for High-Speed Rail (2008)," https://ballotpedia.org/California_Proposition_1,_Bonds_for_High-Speed_Rail_(2008)#cite_note-17

2 Both of us served on the Amtrak Reform Council, which operated from 1998 to 2002.

3 Joseph Vranich and Wendell Cox (April 2013), "California High-Speed Rail: An Updated Due Diligence Report," Reason Foundation, https://reason.org/wp-content/uploads/2013/04/california_high_speed_rail_report.pdf, Pages 10-22.

1.2: Planning the Voter Approved System (2008-2012)

From the beginning, the California High-Speed Rail system was intended to attract substantial private investment. This, of course, would have required a competitive return on investment. However, virtually no private investment has been obtained, which should not be a surprise. High speed rail routes are rarely profitable, often requiring operating subsidies and nearly always requiring subsidies for capital development. According to an International Railway Union official, only two high-speed rail lines in the world had "broken even,"[4] Tokyo to Osaka and Paris to Lyon (France).[5] In California, along with nearly all high-speed rail lines in the world, has had to rely on tax funding, because commercial revenues do not cover the cost of capital and usually operations.

By 2012, costs had risen so much that a political outcry led to adoption of a scaled-back plan to share tracks with conventional trains in parts of the Bay Area and the Los Angeles metropolitan area ("blended" operation). This would necessarily slow down trains and reduce train frequency. It also reduced projected costs, which had grown to $98.5 billion[6] back down to $68.4 billion.[7]

This decision led to opposition by state senator and former CHSRA board chair Quentin Kopp, who characterized the project as so "foolish" that it's "almost a crime,"[8] In a court declaration, Kopp said that it: "is no longer a genuine HSR system, as covenanted to California voters."

1.3: Planning the Scaled-Back System (2012-2024)

Yet, the costs kept rising. By 2019, newly inaugurated Governor Gavin Newsom declared the project "out of control" and ordered a focus on the 171-mile segment between Merced and Bakersfield in the Central Valley (the "Initial Operating Segment" or IOS). The IOS was projected to cost $22.8 billion. This is 3.6 times as costly as the $6.3 billion this segment (Merced to Bakersfield) was supposed to cost in 2008.[9]

The cost escalation continued. In March 2023 the projected cost of the Merced to Bakersfield phase rose to between $32.1 billion to $35.3 billion. This is a "nearly 50% increase" from the estimates in the *2022 Business Plan,* published only a year before.[10] This segment is now projected for completion between December 2030 and 2033. Even that is less than assured. The Peer Review Group notes that achieving this schedule will require better performance relative to deadlines than has been the case up to this time.[11]

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4 Victoria Burnett, "Spain's High-Speed Rail Offers Guideposts for U.S." (May 29, 2009), https://www.nytimes.com/2009/05/30/business/energy-environment/30trains.html

5 More recently, the Shanghai to Beijing high-speed rail line has been reported to be profitable "The Beijing-Shanghai High-Speed Rail Celebrates its 10th Anniversary" (June 30, 2021), http://www.xinhuanet.com/fortune/2021-06/30/c_1127613451.htm

6 Draft 2012 Business Plan.

7 Revised 2012 Business Plan.

8 https://reason.com/video/2017/09/20/quentin-kopp-bullet-train-flashman/.

9 2008 Business Plan.

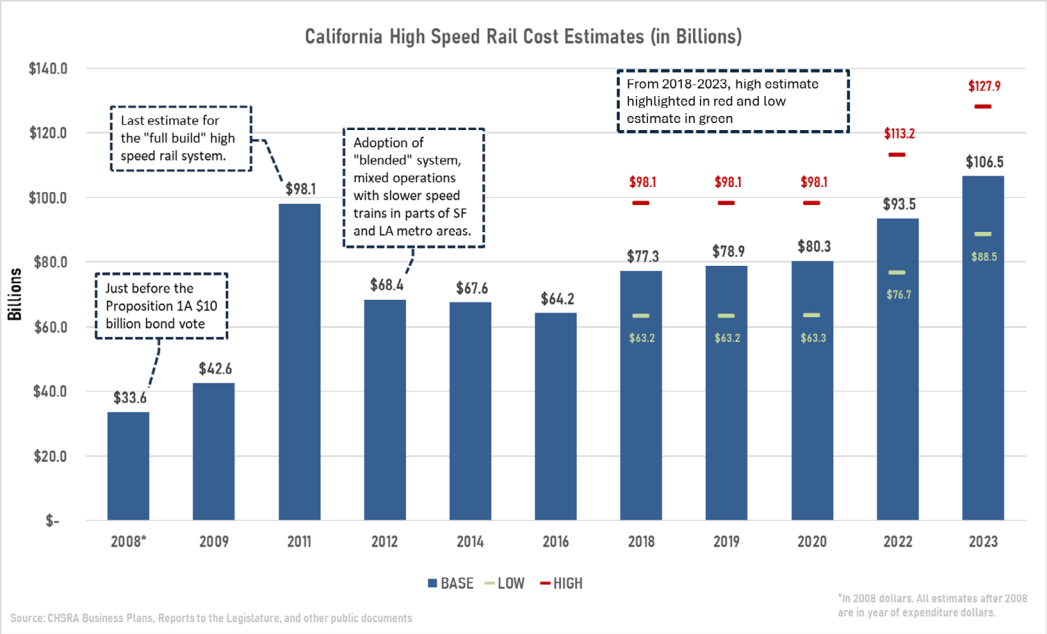
10 CHSRA, 2023 Project Update Report https://hsr.ca.gov/about/project-update-reports/2023-project-update-report.

11 Peer Review Group letter to the Legislature, March 8, 2024.https://www.cahsrprg.com/wp-content/uploads/sites/15/2024/03/Signed-letter-to-legislature-on-2024-BP.pdf

In 2023, Phase I costs were projected from $89 billion to $128 billion (base $106 billion[12]), which compares to the $68 billion base cost estimate when the blended system was adopted.[13] More ominously, the funding gap is now estimated at as much as $93 to $99 billion, plus about $8 billion in cost escalation not yet indicated in the *2024 Business Plan* for completion of Phase I (Section 2.1). Moreover, this could increase much more (Section 3).

Incidentally, *none* of the funding, previously obtained or anticipated was from private sources, despite CHSRA expectations that "significant operating surpluses" would attract private investors. As late as 2009, the CHSRA *Report to the Legislature* projected that approximately one-quarter of the funding for construction would be from private investment (see Section 2.2).[14]

Further, in the likely event that ridership and revenue fail to reach projected levels, public subsidies will be required for operations and maintenance, despite a Proposition 1-A prohibition. At year 10 the cost of Phase I operations is projected at $1.8 billion and at year 30, with capital replacement, the annual cost is projected at $5.2 billion.[15] Further, the revenue projections (principally passenger fares) could be optimistic, which would increase the subsidy requirements. It is not inconceivable that revenues could be less than expenses and that subsidies would be necessary from California taxpayers (Section 2.2).



12 CHSRA provides low, medium and high cost projections, referred to as 15% probability, 50% probability (the base) and 65% probability.

13 Some analysts have suggested that ridership will be well below CHSRA estimates (Section 2.2).

14 CHSRA (2009), *Report to the Legislature, December 2009*, https://railroads.dot.gov/sites/fra.dot.gov/files/fra_net/331/11_Exhibit_9a_CHSRA_Report_to_Legistature.pdf.

15 CHSRA (2024), *High, Medium and Low Cash Flow Analysis*, https://hsr.ca.gov/wp-content/uploads/2024/02/2024-BP-High-Medium-Low-Cash-Flow-Analysis-KPMG-v1.5-A11Y.pdf, Exhibit 2.

2: Situation Analysis

This section includes analysis principally by state entities; the Legislative Analyst's Office (LAO), which provides non-partisan analysis of the state budget, the high-speed rail Peer Review Group PRG), established to provide independent expert opinion on the high-speed rail project, and the high-speed rail Inspector General, established in 2023 by the legislature.

The "Peer Review Group" has a responsibility under state law to: "evaluate the authority's funding plans and prepare its independent judgment as to the feasibility and reasonableness of the plans, appropriateness of the assumptions, analyses, and estimates, and any other observations or evaluation it deems necessary."

The Legislative Analyst's Office was established in 1941 to provide the legislature with fiscal and programmatic expertise and nonpartisan analyses of the state budget also provides evaluation.[16]

The Inspector General is a fully independent office "tasked with conducting independent, objective reviews and investigations of the High-Speed Rail Authority's planning, delivery, and operation."[17]

2.1: An Unfunded Project

The PRG emphasized that Phase I differs substantially from the mandate of the Legislature and the voters. According to the PRG, Phase I will cost at least three times as much, will take 15-20 years longer, and will not realistically meet the trip times specified in Proposition 1-A (Section 2.6).

In legislative testimony, Louis S. Thompson, chairman of the PRG and a long-time World Bank rail expert, put the Phase I funding gap of between $93 billion and $99 billion. But he also noted that there is another $8 billion in Southern California not yet included in the projections.

The PRG added that "There is no possibility that the private sector will make a significant contribution, and there is no existing federal program anywhere near the scale or sustaining level needed. There will need to be significant and sustained additional State funding on a predictable and adequate level." PRG added, "At the same time, completing the full Phase I system poses a growing financial challenge for the State because the gap is already large, and costs have been increasing faster than identifiable potential financing while forecast ridership has fallen."

Thompson added, "Even with a realistic share of new federal funding, the project cannot get outside the Central Valley without added state or local funding." The LAO agreed, emphasizing that CHSRA has not identified funding to construct any portion of Phase I beyond the IOS.

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16 Section 2 citations from the Peer Review Group and Legislative Analyst's Office, specifically, <1> Legislative Analyst's Office (March 28, 2023), "High-Speed Rail 2023 Project Update Report" (presented to the Senate Committee on Transportation), https://lao.ca.gov/handouts/transportation/2023/HSR-Project-Update-032823.pdf; <2> Legislative Analyst's Office (April 12, 2023), "High-Speed Rail 2023 Project Update Report," (presented to the Assembly Budget Subcommittee No. 3 on Climate Crisis, Resources, Energy and Transportation), https://lao.ca.gov/handouts/transportation/2023/High-Speed-Rail-Update-041223.pdf; <3> Remarks by Louis S. Thompson Chair, California High-Speed Rail Peer Review Group Before California Assembly Budget and Transportation Committees (April 12, 2023), https://www.cahsrprg.com/wp-content/uploads/sites/15/2023/11/GGG-LST-Remarks-before-Assembly-Committees-submitted-to-Congress.pdf; <4> Peer Review CHSRA-Group Letter to the Legislature (March 23, 2023). Peer Review Group comments on the 2023 Project Update Report.https://www.cahsrprg.com/wp-content/uploads/sites/15/2023/03/Final-to-legislature-3-23-2023.pdf.

17 https://hsr.ca.gov/office-of-the-inspector-general/#:~:text=Ben%20Belnap%2C%20Inspector%20General&text=Before%20his%20appointment%2C%20Mr.,California%20State%20Auditor's%20Office%2C%20Mr.

2.2: Ridership and Operating Revenue

Broad international research, led by project management expert Bengt Flyvbjerg of Oxford University found that new rail systems tend to have ridership projections that are more than double the eventual results, and has noted optimism bias" in these situations.[18] Similarly, he found that revenue projections and construction costs tended to be higher than projections.

Virtually since the beginning of California high-speed rail planning, concern has been raised about the reliability of the ridership estimates. Ridership is important because if the revenue from passengers is less than projected, there is a greater imperative for operating subsidies. Additionally any high-speed rail related reduction in GHG emissions would be less, undermining achievement of one of the state's principal objectives.

Early on, CHSRA Board member and former State Senate President James Mills resigned because he "couldn't get the truth" out of staff. In 2004, he is reported to have "described the entire project as 'based on a fallacy' of wildly exaggerated ridership projections. It stems, he said, 'from hiring a consulting firm (and) letting them know what you want them to say.'[19]

A 2010 report by researchers from the Institute of Transportation Studies at the University of California was critical of the project's ridership modeling:[20] "we have found some significant problems that render the key demand forecasting models unreliable for policy analysis."

The *2024 Business Plan* projects annual ridership of 28.4 million for Phase I in 2040.[21] The Peer Review Group expressed doubt about this projection, citing comparisons to Amtrak's Northeast Corridor[22] system, which serves New York from Boston Philadelphia, Baltimore and Washington. Figure 2 shows that the 2019 Northeast Corridor ridership, for all services (Acela Express and Northeast Regional) was only 12.5 million annually. The Phase I California projection is 2.3 times as high, at 28.4 million. This is despite the fact that the markets (metropolitan areas) along the Northeast Corridor have nearly double the population of the California's Phase I. Further, the Northeast Corridor has a far stronger density of downtown employment, with four of the five largest central business districts in the United States (New York, Washington, Boston and Philadelphia), with hundreds of thousands of destinations within walking distance or a relatively short taxi ride to or from the station. This high degree of access can give intercity rail an important advantage over airlines and car travel. In contrast, only one of the top six central business districts is on the Phase I line; San Francisco.

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18 Bengt Flyvbjerg (December 2009), "Survival of the Unfittest: Why the Worst Infrastructure Gets Built - And What We Can Do About It," *Oxford Review of Economic Policy*, https://www.researchgate.net/publication/46511516_Survival_of_the_Unfittest_Why_the_Worst_Infrastructure_Gets_Built_-_And_What_We_Can_Do_About_It. Also see B. Flyvbjerg, N. Bruzelius and W. Rothengatter. *Megaprojects and Risk: An Anatomy of Ambition*. Cambridge University Press; 2003.

19 Sean Holstege, "Truth may have come off the tracks," Oakland Tribune, Aug 22, 2004.

20 David Brownstone, Mark Hansen and Samer Madanat (June 2010), "Review of "Bay Area/California High-Speed Rail Ridership and Revenue Forecasting Study: Final Report," https://web.archive.org/web/20130607044001/https://its.berkeley.edu/publications/UCB/2010/RR/UCB-ITS-RR-2010-1.pdf, Prepared at the request of the California Senate Transportation and Housing Committee.

21 It is virtually impossible for Phase I could be completed by 2040. This projection is based on demographic assumptions with a completed high speed rail Phase I. Projections for 2050 are about the same, which is consistent with the virtually zero growth population projections of the California Department of Finance.

22 Peer Review Group letter to the Legislature, March 8, 2024. https://www.cahsrprg.com/wp-content/uploads/sites/15/2024/03/Signed-letter-to-legislature-on-2024-BP.pdf.

Our 2008 *Due Diligence Report* projected ridership 64% below the CHSRA projections, based on the performance of the Amtrak Northeast Corridor ("Acela") and comparable international systems.[23] After CHSRA adopted the "blended" approach, our 2013 *Updated Due Diligence Report* estimated ridership to be from 67% to 77% less than the revised CHSRA forecast.[24]

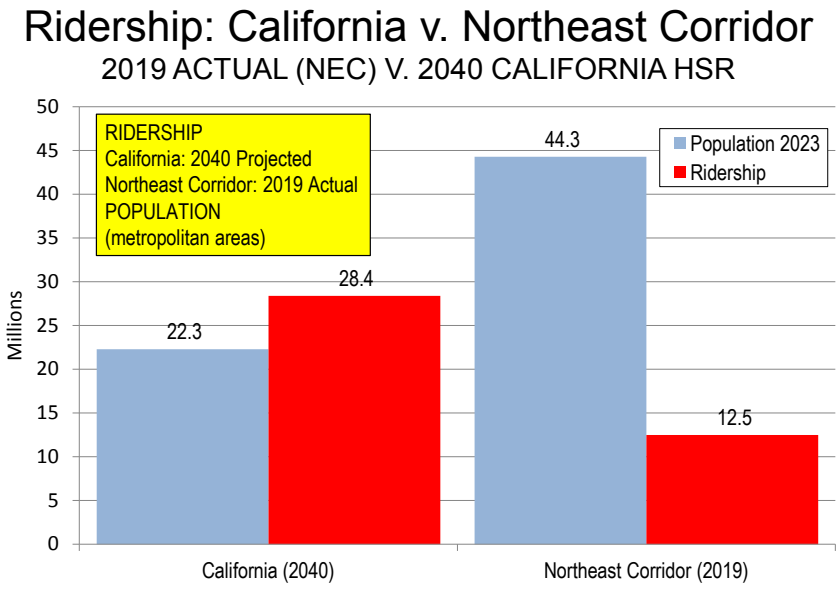

Figure 2

Further, the rosy excess of revenues over expenses projected by CHSRA did not attract private investors. The Phase I ridership projections seem implausibly high and this could lead to a need for operating subsidies.

2.3: Confusing Capacity and Ridership

CHSRA has long claimed that the additional capacity to be provided by high-speed rail will be a more efficient substitute for expansion of roadways and airline volumes as the state grows. CHSRA notes that the cost of Phase I is well below the cost of building equivalent highway and airport capacity, citing a cost range of from $179 billion to $253 billion, compared to the $89 billion to $128 billion high speed rail cost. A previous iteration of this claim[25] was roundly criticized by LAO as "overstated," elaborating that "This comparison is very problematic because" … the claimed amount… "is not what the state would otherwise spend to address the growth in inter-city transportation demand.

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23 Wendell Cox and Joseph Vranich (September 2008), "The California High-Speed Rail Proposal: A Due Diligence Report," Reason Foundation, Citizens Against Government Waste and Howard Jarvis Taxpayers Association, https://reason.org/wp-content/uploads/files/1b544eba6f1d5f9e8012a8c36676ea7e.pdf,

24 Joseph Vranich and Wendell Cox (April 2013), "California High-Speed Rail: An Updated Due Diligence Report," Reason Foundation, https://reason.org/wp-content/uploads/2013/04/california_high_speed_rail_report.pdf.

25 https://lao.ca.gov/handouts/transportation/2011/HSRA_Business_Funding_plan_11_29_11.pdf

Commenting on the 2012 calculations, a *Mother Jones* columnist characterized CHSRA's capacity analysis as "unrealistic estimates" of alternatives and "jaw-droopingly shameless," adding that "A high school sophomore who turned in work like this would get an F."[26]

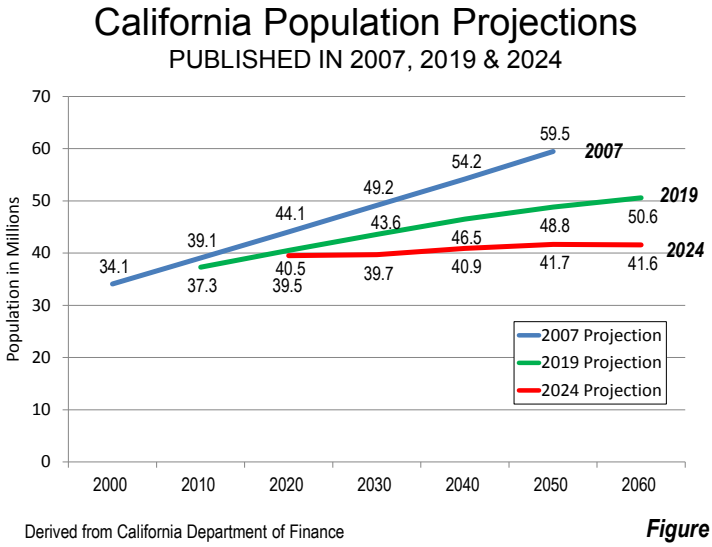
In 2014 Joseph Vranich and I estimated the cost of the additional road and airport capacity needed would be $3.3 billion, about 98% below the CHSRA estimate.[27]

According to the 2019 CHSRA *Equivalent Capacity Analysis Report* (which is the basis of the CHSRA capacity analysis referred to above):[28]

> *"The state's transportation system is becoming increasingly gridlocked, and it is a problem that will only worsen. The state estimates that its population will grow by an additional 6.5 million people by 2036; by 2050 the population is estimated to grow to a total of 50 million people."*

These projections being used by CHSRA are out of date. The State Department of Finance (DOF) projects a state population of 42 million in 2050, a full 8 million below the CHSRA 50 million assumption cited above. There has been a "sea-change" in California's population prospects in the last two decades (Figure 3). It is notable that in July 2023, interim DOF projections were issued and indicated slightly *lower* population figures. This was well before the *2024 Business Plan.* Use of the current data would have probably reduced the ridership projection.

Finally, it is notable that nearly all highway and airport infrastructure is financed from fees and taxes paid by *users* (gasoline taxes, landing fees, etc.), rather than general taxation. The opposite is true with the California high-speed rail infrastructure, all of which has been financed by taxpayers.



Derived from California Department of Finance

Figure 3

26 Kevin Drum, "California's Ridiculous High Speed Rail Plan," Mother Jones, January 17, 2012, http://www.motherjones.com/kevin-drum/2012/01/california-hsr-now-even-more-ridiculous

27 Updated Due Diligence Report (2014).

28 California High-Speed Rail Authority, "2019 Equivalent Capacity Analysis Report" (2019), https://hsr.ca.gov/wp-content/uploads/docs/about/business_plans/2020_Business_Plan_2019_Equivalent_Capacity_Analysis_Report.pdf.

2.4: Greenhouse Gas (GHG) Emissions

The California high-speed rail system has been characterized as playing a major role in the state's greenhouse gas emissions (GHG) reduction strategy. Planners imagine that high speed rail will attract enough drivers and airline passengers to materially reduce GHG emissions. Yet, as rising costs pushed back completion dates and scaled back the system, other GHG strategies, such as electrification of the road vehicle fleet, have reduced the potential GHG reductions from high-speed rail.

PRG has told CHSRA that CO2 emissions avoided should not just be shown in metric tons, but should also be shown "as a percent of the state total." PRG adds that the high-speed rail "contribution is only a small percentage of the state's total GHG target. PRG also said that "The potential impact of electric vehicles should also be acknowledged (shifting traffic from electric vehicles to HSRA, both using the same electricity, won't reduce CO2 emitted)."[29]

Such an evaluation is telling, with high-speed rail costing from between $89 billion and $128 billion, the cost per metric ton of greenhouse gas (GHG) emissions avoided ranges from $873 to $1,255. This substantially surpasses the "social cost of carbon," a highly contested figure estimated to lie between $1 and $340 per metric ton.[30] The implication is that projects with more favorable opportunity costs may have been overlooked, suggesting a potential misallocation of resources.

2.5: The 2023 Federal Grants

CHSRA had hoped to obtain about $8 billion from the federal government in 2023. However, the Biden Administration awarded only $3.3 billion. While this would be significant for most projects, it is a "drop in the bucket" for a project that could cost as much as $128 billion.

The LAO notes that CHSRA "has not identified a specific, credible plan for (1) how much funding it would secure from each specific source or (2) how it plans to obtain such funds. Absent such a plan, the path to completing Phase I is unclear".[31] The PRG found that: "The unfunded gap is growing. In fact, there has always been an unfunded gap between identified credible sources of funding, on the one hand, and project costs on the other."[32]

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29 2020 Business Plan.

30 "E&E News by Politico" (November 21 2022), https://www.eenews.net/articles/epa-floats-sharply-increased-social-cost-of-carbon/

31 Legislative Analyst's Office (March 28, 2023), "High-Speed Rail 2023 Project Update Report" (presented to the Senate Committee on Transportation), https://lao.ca.gov/handouts/transportation/2023/HSR-Project-Update-032823.pdf.

32 Peer Review Group Letter to the Legislature (March 23, 2023). Peer Review Group comments on the 2023 Project Update Report.https://www.cahsrprg.com/wp-content/uploads/sites/15/2023/03/Final-to-legislature-3-23-2023.pdf

2.6: Further Cost Escalation

In 2023, the PRG has characterized the Central Valley (IOS) as "supposed to be the 'easy' part, adds that contracts have overrun by 97 percent so far," the PRG reported in 2023. But just a year later, the PRG reported that this had increased to 159%. The cost control challenges are likely to become greater. The PRG indicates that "The unbid part of the project, especially tunneling and electrification, is likely to be the hardest and most technically challenging part of the project."

According to the PRG, the high speed rail results "are significantly below the expectations promised by Proposition 1-A, and this should encourage the Legislature and the Governor to reassess the viability and priority of the project given the other financing needs the State faces."

The PRG indicates that "There is no longer a projected completion date for the full Phase I system, because there is no funding on which to base a credible schedule."

2.7: Assessment

The California high speed rail Phase I will fall considerably short of its requirements under AB 3034. Most importantly, it was not completed by 2020, and little construction was underway by that date. Even if the Phase I blended system eventually begins operation, none of the travel time requirements will be met. According to CHSRA, the fastest San Francisco to Los Angeles travel time will be 3:05, not the legislatively mandated 2:40. The San Francisco to San Jose fastest travel time will be 0:52, not the mandated 0.30, and the fastest San Jose to Los Angeles travel time will be 2:31, up from the mandated 2:10.[33]

The PRG and LAO have raised existential issues with respect to high speed rail. The PRG noted that finishing the IOS to high-speed standards "makes no sense without a commitment to build the entire Phase I system." The PRG added, "If there is no commitment to the full Phase I, then it is **clear** that the current $35.3 billion plan for MCD to BKF **cannot be justified**"[34] The PRG suggests "At the same time, completing the full Phase I system poses a growing financial challenge for the State because the gap is already large, and costs have been increasing faster than identifiable potential financing while forecast ridership has fallen." The LAO notes that CHSRA "does not identify specific sources of funding to construct any portion of Phase I beyond Merced to Bakersfield." The LAO suggests that the Legislature "may want to consider whether it is comfortable with" undertaking activities beyond the IOS. These would include proceeding with construction of the Merced to San Francisco and Bakersfield to Anaheim segments that would complete Phase I.

The PRG recommends that "in the absence of a commitment to Phase I, the legislature should ask CHSRA for an alternative plan, such as using existing connections to Merced and to Bakersfield; eliminating electrification and purchasing better diesel (or other) rolling stock.

With no official projected date for the full Phase I line to open, it might take more than the 15 to 20 years, suggested by the Peer Review Group. Currently, projects on the Merced to Bakersfield segment are averaging delays of more than six years.[35] This combined with the expected project delivery requirement of up to nine years for the Palmdale to Burbank segment, with its extensive tunneling, could place completion *after* 2045.

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33 CHSRA (2024), *Ridership and Revenue Forecasting Report to the 2024 Business Plan*, https://hsr.ca.gov/wp-content/uploads/2024/05/Ridership-and-Revenue-Forecasting-Report.pdf

34 Emphasis in original

35 Peer Review Group, March 8, 2024.

This is, coincidentally, the same year the state intends to achieve net-zero emissions. There is a potential that the California high-speed rail line, so frequently trumpeted for a pivotal role in reducing GHG emissions may play virtually no role at all.

Meanwhile, as the cost escalation and delays have overtaken planning of the system, Phase II has become virtually absent. There would be no point in expending effort on Phase II with the funding uncertainty that plagues Phase 1. Thus, while there continues to be doubt as to when the currently planned "blended" Phase I will be completed, the prospects for completion of Phase II are even more remote. This includes service to some of the state's largest metropolitan areas, Riverside-San Bernardino, San Diego and Sacramento. (Figure 4).

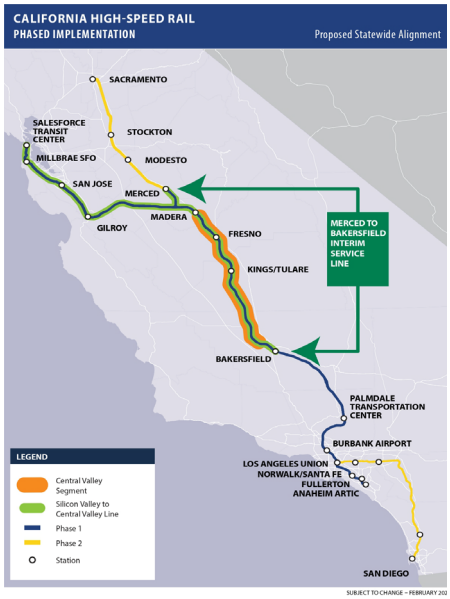

Figure 4

3: The Future: The Problems Are Not Over?

The PRG has observed, "Project costs have risen year after year, and they continue to rise with no clear end in sight," and further that there "is no reason to conclude that the Authority's problems on the project are over."[36]

The LAO added: "However, estimates for portions of Phase I beyond Merced to Bakersfield are subject to substantial uncertainty and therefore could ultimately be much higher. This is because (1) many of these segments are in the early planning stages and additional changes to scope may be necessary as designs are refined, (2) some segments involve relatively complex and unpredictable work (such as tunneling), and (3) the state has experienced significant construction cost escalation since some of these costs were last comprehensively updated."[37]

If the project's cost escalation trends continue, substantial additional cost increases beyond the present maximum of $128 billion could occur. A simple analysis of cost escalation trends already experienced makes the point.

Two trends were used in the analysis (1) the nearly 400% increase in the cost of the Merced to Bakersfield segment from 2008 to 2023, and (2) the 159% increase in costs relative to construction awards in the Merced to Bakersfield segment, described by the Peer Review Group (Section 2.6) .[38] Both estimates are increased by the $8 billion in additional costs identified by the Peer Review Group (Section 2.1).

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36 Peer Review Group Letter to the Legislature (March 23, 2023). Peer Review Group comments on the 2023 Project Update Report. https://www.cahsrprg.com/wp-content/uploads/sites/15/2023/03/Final-to-legislature-3-23-2023.pdf. https://www.cahsrprg.com/wp-content/uploads/sites/15/2023/03/Final-to-legislature-3-23-2023.pdf.

37 Legislative Analyst's Office (April 12, 2023), "High-Speed Rail 2023 Project Update Report," (presented to the Assembly Budget Subcommittee No. 3 on Climate Crisis, Resources, Energy and Transportation), https://lao.ca.gov/handouts/transportation/2023/High-Speed-Rail-Update-041223.pdf

38 Peer Review Group Letter to the Legislature (March 23, 2023). Peer Review Group comments on the 2023 Project Update Report.https://www.cahsrprg.com/wp-content/uploads/sites/15/2023/03/Final-to-legislature-3-23-2023.pdf.

Averaging these two trends yielded a final cost for completion of Phase I from a low of $169 billion (30% probability[39]), to $208 billion (50% probability) and a high of $255 billion (63% probability).[40] These estimates are nearly double the current projections (Figure 5).

These estimates could well be low. The potential for cost escalation is much greater in the San Francisco and Los Angeles segments than in the Merced to Bakersfield segment, because of their extensive tunneling and far more challenging topography. At this point, the actual taxpayer risk cannot be known.

4: Policy Recommendations

Implementation of the following recommendations would serve taxpayer interests.

- Construction should be limited to finishing the 119 mile Madera to Shafter segment, discontinuing work on the IOS extensions (52 miles) to Merced and Bakersfield (The PRG considers the IOS unjustified without a full Phase I funding commitment).
- There should be no further public expenditure on the extensions from the Central Valley to the San Francisco Bay and Los Angeles areas. Nor should there be any expenditure on Phase II (extensions to Sacramento, Riverside-San Bernardino and San Diego).
- There should be no further federal funding for California high speed rail.

Finally, the federal government should not fund projects that do not have comprehensive funding programs.

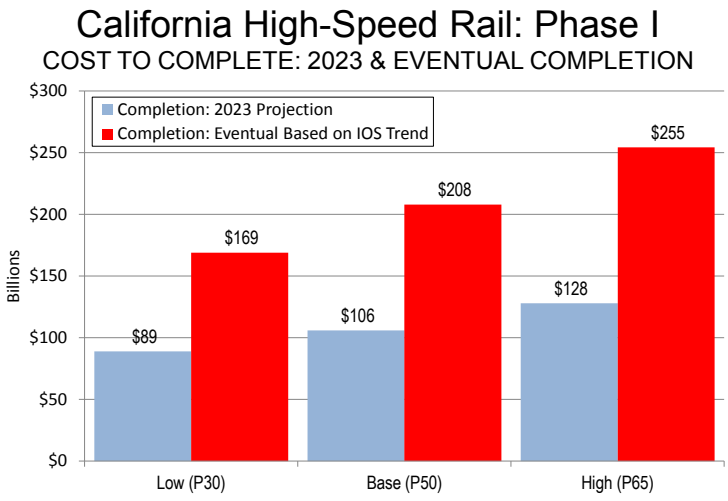

Figure 5

39 Probability of delivering the project within the CHSRA estimate.

40 This is not a engineering projection, but simply a calculation based on CHSRA cost trends on the portion of the system now completed or underaconstruction (IOS).