The Financial Risks of California's Proposed High-Speed Rail Project

A Review And Assessment Of Publicly Available Materials On The California High-Speed Rail Authority's Financial Plans

October 12th 2010

"We do not oppose high-speed rail in concept. It seems to work in parts of Europe and Japan and possibly elsewhere. The 2008 Prop 1A promise that captured many voters was that the California High-Speed Rail (CHSR) would not cost the taxpayer a penny. After months of work on this report, we are forced to conclude that the Authority's promise seems an impossible goal."

We are grateful to the Community Coalition on High Speed Rail for providing a virtual 'home' for this review. For downloadable copies of this report and attachments, visit their website **www.cc-hsr.org**

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TABLE OF CONTENTS

CONTEXT-SENSITIVE OVERVIEW

While our findings focus only on the California High-Speed Rail (CHSR) project, they must be put into the context of a continued shortfall of State of California revenues to meet its financial obligations. State issued IOUs, employee furloughs and salary reductions, significant cutbacks to education, closed parks, a deferred proposition on water projects, unrepaired potholes, and deferred maintenance on railroad signaling systems, bridges and highways are symptoms of the State's desperate financial situation.

As an example, the impact of financing the high-speed rail system on funding for our state's education system is sobering. Cutting back on both public school and university funding, forcing layoffs and increasing tuition is compromising the future of what was once the model for other state educational systems. To put the real cost of the CHSR in perspective, debt-servicing costs on only the voter-approved $9.95 billion of general obligation (GO) bonds represents more than $60 million per month of principal and interest commitment. If California can get someone to buy those approved $9.95 billion of bonds, servicing that debt alone will wipe out one medium-sized primary school each month, or over 100 schools before the proposed CHSR would carry its first riders in 2020.

We respectfully submit our findings for public review. We recognize that many dedicated consultants and employees have prepared the California High-Speed Rail Authority's (CHSRA) materials. However, we find the quality of the CHSRA's work product to verge on being promotional. CHSRA financial documents are not of a quality that would attract investors concerned about risks, returns on investments and the long term financial sustainability or economic viability of the proposed CHSR system as demanded in the Authority's 1996 charter.

Until these financial questions are answered and Californians can be assured that the CHSR project can meet its financial obligations to produce operating surpluses, require no operating subsidy, and create the hundreds of thousands of jobs it promises, we believe the entire project must be postponed or terminated.

PEER REVIEW & VALIDATION

This Review is the product of the efforts of experienced corporate business practitioners, economists and finance experts who volunteered their time to try to understand the California High-Speed Rail Authority's (CHSRA) documents on financing the proposed California High-Speed Rail (CHSR) project.

These individuals worked without corporate, government or private sponsorship. They read considerable materials from both proponents and opponents of the proposed California High-Speed Rail (CHSR) project. They met individually and in groups to give direction for the paper and reviewed and commented on drafts. Over several months of mid-to-Q3 2010, the paper came together to reflect the common themes and conclusions that arose in these discussions.

The authors shared drafts with professionals who understand finance and comprehend the implications of the analyses.

Over seventy Principal Reviewers have read the report and agree with the Authors' findings and endorse their conclusions.

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EXECUTIVE SUMMARY

After months trying to understand the available evidence and forecasts from the California High-Speed Rail Authority (CHSRA), our general conclusion is that there is little if any chance the system will pay for itself. That requirement is the baseline of AB3034.

The 2008 and 2009 CHSRA business plans asserted the system would earn an operating surplus, the most recent stating it would do so in the system's first year of operations. The private sector was supposed to be a financial partner, local governments were supposed to pitch in, and the Federal Government was to have funded about 45% of the presently estimated costs. The stark conclusion, of this financial Review, based only on CHSRA's Phase I plans and supported by these pages, is that CHSRA's financial promises can't be kept.

After reviewing this paper and documents in the End Notes, the Authors and Principal Reviewers cited in the Preface agree on the following specific conclusions.

1.0 Broken Promises And Unmet Demands From The Legislature Diminish The CHSR Project's Credibility

1.1 The CHSR Project That Voters Chose In 2008 Promised To Link Seven Cities, But Links Only Three. Although San Diego, Riverside, Oakland and Sacramento were part of the official ballot description for Prop 1A, what emerged after the vote as Phase I is only for Los Angeles/Anaheim to downtown San Francisco

1.2 The Prop 1A $33 Billion Capital Cost Promise Morphed Into A $42.6 Billion Capital Cost. How did the CHSR project drop routes but increase its costs?

1.3 The Promised $55 One-way SF-LA Ticket Morphed Into A $105 One-way Ticket After Prop 1A. Voters chose what looked like an attractive fare, but a year later were presented with a fare that nearly doubled.

1.4 Five Months Before Prop 1A Passed, The Authority Knew That Private Sector Participation Was Conditioned On Near Total Federal And State Capital Building The CHSR Project. IMG told the Authority that

private sector firms were really only interested in building the CHSR if the government paid for it.

1.5 Five Months Before Prop 1A And Three Months Before AB3034 Passed, The Authority Learned The Private Sector Would Only Operate The CHSR If Given A Revenue Guarantee. IMG and Goldman Sachs told the CHSRA Board that the private sector considered the ridership risks too high to finance CHSR without a revenue guarantee

1.6 The CHSRA Did Not Meet The Senate's Demand For An Investment Grade Business Plan Prior To The 2008 Proposition 1A Vote. Although demanded by September 1,2008, the promotion-oriented document submitted to the Senate came after the election.

1.7 CHSR Proponents Promised Prop 1A Voters The Project Would Pay Its Way; But By Mid-2008 The CHSRA Knew The State Would Have To Guarantee The Operators' Revenue. Proponents promised "*THE USERS OF THE SYSTEM PAY FOR THE SYSTEM"*; that is riders, not taxpayers, would pay for the system.

1.8 Despite The Senate's Demand, CHSRA's Business Plans Have Still Not Met The Criteria Or Quality For Investment Grade. The Senate still does not have an investment grade business plan two years after demanding one.

1.9 A Year After AB3034 Passed, IMG Again Told The Authority That Private Sector Financing Would Only Become Available With A Revenue Guarantee. There was little or no change in the private sector's view of the financial worthiness of the CHSR project in the intervening year.

1.10 Although Twice Demanded By The Legislature And Promised Before September 2010, CHSRA Has Not Produced A Risk Mitigation Plan. This is the *sine qua non* of finance; what needs to be done if the scenario as presented fails to take place.

1.11 Despite The Demands Of AB3034 More Than Two Years Ago, No Independent Peer Review Group Has Reviewed And Assessed The CHSRA's Financial Plans. How the Authority can ignore that essential condition of AB3034 is a mystery.

2.0 CHSRA's Ridership Forecasts – Central to the System's Financial Outcome – Are Far Too Optimistic

2.1 Evidence-Based Analyses Contradict CHSRA's Forecasts. Empirical precedents from the USA and Europe suggest CHSR ridership by the tenth operating year (2030) should be 5-10 million, not the 39 million annual passengers claimed in the CHSRA models.

2.2. Independent Experts' Refute CHSRA's Ridership Model. Three independent economists and transportation groups have found significant flaws in the CHSRA consultant's ridership model involving uses of coefficients and inappropriate data series. These findings have already produced calls for even more independent reviews of this critical planning element.

3.0 CHSRA's Estimated Phase I Capital Costs Should Be Significantly Higher.

The history of cost overruns on megaprojects such as high-speed rail suggests the CHSRA has seriously underestimated the price tag for Phase I (Los Angeles to San Francisco). Using overruns from recent infrastructure projects as a guideline suggests the present $42.6 billion estimate could reach $100 billion or greater.[1]

3.1 Megaproject Histories Show Costs Were Substantially Underestimated. Transport projects' build-out costs can be anywhere as high as 600% of their original estimates.

3.2 The Costs Of Phase I Of The CHSR Project Could Fall Between $62 Billion And $213 Billion. Comparing the CHSR's estimated costs to real world outcomes gives a sobering view of how high the build-out costs could go.

4.0 CHSRA's Revenue Assumptions Are Too High And Its Operating Expenses Too Low

4.1 CHSRA Used Inflated Auto And Airfare Prices To Capture More Riders And Revenue. A detailed analysis of actual automotive and airline ticket costs between Los Angeles and San Francisco concludes that the CHSRA's input prices to its revenue model for auto and air travel should be at least 25% lower. Even using the Authority's ridership forecasts, the CHSRA would not gain enough revenue to avoid requiring an operating

subsidy to service its operating debt, a situation strictly prohibited by AB3034.[2]

4.2 If CHSRA Had Used An Evidence-Based Pricing Approach, Ridership Estimates Would Have been Lower. Empirical analysis of the per-passenger mile ticket charges for five European and Japanese high-speed rail systems suggests ticket pricing assumptions should be about $190 for a one-way SF-LA passage, about 80% higher than the $105 CHSRA's present model uses.

4.3 CHSRA's Assumptions On Operating Expenses Do Not Reflect Real World Practices. Many of CHSRA's assumptions about operating expenses do not conform to rigorous accounting and financial practices. CHSRA's documents fail to distinguish between variable and fixed costs, do not recognize that maintenance costs increase yearly, do not include insurance costs, and do not acknowledge that labor cost increases will be extremely difficult to manage.

5.0 Using The CHSRA's Data On Revenues and Expenses, The System Will Never Achieve Positive Cash Flow Without All The Assumed Federal Grant Monies

5.1 The Warren Financial Model Of The CHSR Highlights The Costs Taxpayers Will Have To Bear. Without independent access to the CHSRA's financial model, several of the authors built a surrogate model based on the assumptions stated in the CHSRA's 2009 Business Plan, with particular focus on the issue of 'if and when' the CHSR might achieve positive cash flow. This 'Warren Model' of CHSR's prospects for being financially self-sustaining assumes the point of view of the State of California's obligations, not the Authority's view that it can 'off-load' its financial obligations to other entities.

The model finds that unless the Federal Government supplies the CHSR with the complete package of $19 billion of grants towards the supposed $42.6 billion of capital costs currently needed, the CHSR will never achieve positive cash flow.

Any other finance scenario will require visible or seriously large debt servicing. Debt servicing becomes an operating expense. Therefore, if built, the CHSR will require a continual and reliable subsidy, now referred to by the CHSRA as a 'revenue guarantee'. The authorizing legislation for the system, AB3034 (Galgiani),

explicitly prohibits such a subsidy.[3] Meanwhile, the CHSRA commissioned the Infrastructure Management Group Inc. to outline how to interpret a revenue guarantee as something other than an operating subsidy. [4]

In this Review, numerous scenarios are analyzed to show the sensitivity and magnitude of the peak cumulative negative cash flows to various combinations of financing, various degrees of successful operating results, and the 'guaranteed' or 'at risk' returns for the private equity investor.

5.2. High-speed rail systems do not break even. The Director of High-Speed Rail at the International Union of Railways (IUR) stated that only two segments of two high-speed rail systems in Europe and Japan break even. A 2004 DOT study, then a the Congressional Research Service study reconfirmed this. In 2009 Amtrak's Inspector General documented the on-balance sheet and off-balance sheet subsidies European rail operators receive. Recently a World Bank report said the same thing. This reality should have been reflected in the CHSRA's 2008 promotion of Prop 1A. CHSRA's negligence of these facts is neither understandable nor excusable.

6.0. Complete CHSR Funding Has Not Materialized, Nor Is It Likely To Be Forthcoming.

As of third quarter 2010, the prospects for obtaining the funds listed in the Authority's 2009 Business Plan do not seem bright. There is a large and real funding gap between the sizes and sources the CHSR needs and what it has or is likely to get. Others have also pointed out this discrepancy. For example, within weeks of the April 2010 ARRA allocation that looked so hopeful, State Auditor Howle reported to the Governor: *"The program risks significant delays without more well-developed plans for obtaining funds."*[5]

6.1 CHSRA's Proposed Capital Budget Sources Are Heavily Skewed To 'Free' Government Money. The 2009 CHSRA Business Plan specified four sources of capital prior to the start of operations in 2020***.***

Federal Grants	$17-19 billion
State Grants (actually Prop. 1A bonds)[6]	$9.95 billion
Local Grants	$4-5 billion
Private Debt or Equity Funding	$10-12 billion

6.2 Purchasers For The $9.95B Of Guaranteed GO Bonds Have Not Come Forward. Even with a State of California guarantee, the future of bond sales is questionable. State Treasurer Lockyer said*, "I would be reticent to try to go to market to issue bonds to finance the state's share. The only discretion I have is to say, 'You can't sell this.'"* [7]

6.3 The Probability Of CHSRA Receiving The Full Complement Of Federal Grants Is Small. As of August 2010, the total the Authority could use for building the project is $4.7 billion -- the sum of the $2.34 billion ARRA grant from the Federal Government and the dollar-for-dollar match authorized by Prop 1A, less the $400 million earmarked in the Federal grant for the San Francisco Transbay Terminal. This totals about 11% of the currently estimated $42.6 billion projected cost. We have found no provision for financing above that projected cost.

6.4 CHSRA's Assumptions About Local Government Assistance Have No Historical Basis. CHSRA's assumptions about the ability of California's fiscally strapped cities and counties to provide $4-5 billion 'local contribution' grants for the CHSR project fail to take into account the financial distress of those governments. They are furloughing or laying-off police officers, teachers and other employees. Local governments have almost never funded transit projects outside their jurisdiction. The prospect of gaining such local funding through grants or secured debt within the foreseeable future is doubtful.

6.5 Twenty-three Months After Passage of Proposition 1A, There Is No Private Equity Or Debt-Based Financing for the CHSR. The United States' risk capital providers, of which California-based companies are leaders, have not come forward in the past 23 months for the CHSR. This suggests there is little appetite for either a guaranteed or non-guaranteed return on investment in the CHSR project. Given the State's continued budget shortfalls, investment in California State projects, particularly of the order of magnitude of Phase I of the project (the segment between San Francisco and Los Angeles, without the Oakland, Sacramento or San Diego destinations) entails far greater risk than normal. Moreover, our analysis suggests the risk-adjusted return profile of CHSR will be highly unattractive to private investors. This further undermines the project's financial plans.

6.6 At Present California Is In The Least Favorable Position Possible To Go To Debt Markets To Fund The CHSR Project. Even if the Great Recession had not happened and the Federal Government was not purposely and rapidly increasing its debt through fiscal stimulus, the State's profligate

spending even in 'good times' has put it at a disadvantage relative to other borrowers. Add to that the new dimensions of increased scrutiny by the State Treasurer and the SEC, and California will be hard pressed to attract bond buyers.

6.7 Discussions With Sovereign Governments Or Others About Using 'Creative Financing' To Fund CHSR May Not Be In The Best Interests Of California. Discussions by the CHSRA with sovereign financiers (such as China, France, Germany or Japan), or such sovereign financiers in combination with foreign builders, operators and private financiers, could be a dangerous foray into using 'creative financing' to fund CHSR. This could result in an excessively leveraged CHSR if the projected federal and city/county grants are indeed supplemented by foreign loans requiring ongoing debt service payments. What could be helpful to get the CHSRA's project built may be bad for California in several different ways.

7.0 CHSRA's Job Creation Forecasts Are Too Vague And Too Large To Be Credible.

The CHSRA predicted 600,000 jobs would be created over the course of the CHSR construction period. Whether that is 60,000 jobs for ten years or 600,000 for one year or some other possibility is not defined. The CHSRA forecast of 450,000 permanent jobs is unsubstantiated by either methods or evidence presented in the CHSRA's reports.

7.1 CHSRA Is Silent On Exactly When Or Where Jobs Occur, Or How Many FTE Jobs Each Year Their Forecasts Represent. Promises of construction and permanent employment should be accompanied with information about whether these are Full Time Equivalents (FTE's); what the average income per job would be; what years these jobs would be created, and how long – if not forever – would these permanent jobs last.

7.2 CHSRA's Forecasted Employment For The 8-10 Years Of Construction Is Seriously At Odds With Estimates Based On Bureau Of Labor Statistics Data. The 600,000 construction jobs forecast differs significantly from other forecasts using Bureau of Labor Statistics (BLS) data.

7.3 If 'Permanent Jobs' In CHSRA's Lexicon Means Both CHSR Employees, As Well As Those Employed Permanently Because CHSR Exists, Their Forecast Is Beyond Believable. In August 2010, there were 15,968,000 jobs in California while there were 239,586 active State of

California employees. To claim a train would create twice the number of employees as the entire State government, whether engineers, maintenance workers, local coffee shopowners or rental car agencies is highly questionable.

7.4 If 'Permanent Jobs' In CHSRA's Lexicon Means Only CHSR's Employees, Then Few Jobs Will Be Created. If CHSRA means 'permanent' to be jobs created over a 40-year life of the project, the impact – 0.1% –is miniscule.

7.5 There Are Inconsistencies In CHSRA's Forecasts That Raise Questions About The Rigor Of Their Methodologies For Computing Employment. CHSRA appears to be confused about its CHSR Phase I employment forecasts.

INTRODUCTION

This report came about because professionals conversant with finance, economics, urban planning and business operations found claims by the California High-speed Rail Authority implausible. Extremely high ridership forecasts coupled with assertions of low fares and construction costs just didn't pass 'the smell test of my professional experience' as one executive put it. To claim the system was to have an operating surplus in its first full year of operations surpassed both historic evidence and credibility.

We believe the CHSRA Board, which successfully promoted the project to voters in 2008, has become captive to its own thinking. Consultants to the CHSRA seem to be repeating the same conclusions, despite credible challenges. This pattern has continued throughout 2009 and deep into 2010, despite serious questions from key State Senators, the Legislative Analyst's Office (LAO), the State Auditor and independent experts' publications. Once the flow of Federal time-dependent American Recovery and Reinvestment Act (ARRA) funds seemed imminent, the Authority appeared reluctant to ask the hard questions that private and public sector due diligence demanded.

This report challenges most of the key assumptions and findings that would affect the financial performance of the CHSR. To find answers we could rely on, we asked:

- Do the Authority's ridership forecasts have a chance of 'being roughly right' or are they unrealistically optimistic?
- How realistic are CHSRA's estimated capital costs for Phase I?
- How reliable are the CHSRA's assumptions about operating expenses and revenues? Are they based on real-world experience?
- Based on CHSRA's financial model, can an operating surplus of $370 million in the first year of operations (2020), supposedly growing to $3.9 billion by 2035, be substantiated?
- What is the likelihood that all Federal and local government grants assumed by the CHSRA will actually be made?
- Why haven't California's world-beating risk capital firms stepped forward with their share?
- How realistic are CHSRA's forecasts of temporary and permanent job creation?

As we prepared this document, we realized we were 'peeling an onion.' The more we pursued a topic, the more we were frustrated by the lack of a data trail. Still more frustrating were the contradictions between the CHSRA's conclusions and the history and evidence of planning and operating high-speed rail systems throughout the world. We were also disturbed by the lack of precision in key aspects of fiduciary audits prepared by the Authority's consultants. Repeated instances of such poor work products also diminished our trust in their conclusions.

This report is not kind to the CHSRA or its consultants' work. It should not have been necessary to spend the many weeks we did researching documents, drafting analyses, checking conclusions with peers and editing our work. Voters in 2008 deserved a financial plan that was clear and up-front about the challenges of getting Californians to abandon their autos for a new transport mode. We expected transparency on how operating surpluses could be made when high-speed rail's history and our financial model showed otherwise. We expected that assertions of ridership and ticket pricing would be grounded in real airline fares and real high-speed rail ticket prices. Because few of those expectations were realized in the CHSRA's documents, we lost confidence in its ability to plan -- much less operate -- a financially viable system.

We do not oppose high-speed rail in concept. It seems to work in parts of Europe and Japan and possibly elsewhere. But it works in those places due to unique combinations of higher population densities, long histories of train travel, less-dominant car cultures, shorter distances between metropolitan centers, and higher tax rates that provide subsidies. The 2008 Prop 1A promise that captured many voters was that the CHSR would not cost the taxpayer a penny.[8] After months of work on this report, we were forced to conclude that the Authority's promise seemed an impossible goal.

We hope this report is widely read and becomes a source document for others concerned with the many unsubstantiated claims the CHSRA has made. Those who believe California should have the proposed system will challenge this report. Those who think they stand to gain from rail system construction, equipment or technology sales, or operations and maintenance will scorn it. We only ask supporters and critics to take the time to read our material and the source documents. Don't take our word or those of others uncritically. Draw your own conclusions. But draw those conclusions after carefully studying the financial viability of the State's single largest infrastructure project, one that could change the State's financial future for a long time.

BACKGROUND OF HIGH-SPEED RAIL IN CALIFORNIA

In the mid-1990s the State began exploring a possible high-speed rail system. Governor Pete Wilson and the Legislature created the California High-speed Rail Authority (CHSRA) in 1996 and tasked it *"to prepare a plan and design for construction of an economically viable high-speed train line linking major metropolitan areas."*[9] [emphasis added]

By 2008 the Authority had produced what it considered *"investment-grade forecasts of ridership, revenue, cost and benefits of the system"* for 800 miles of high-speed rail *"designed to carry over 100 million people a year by 2030."*[10] CHSRA had also produced a certified statewide program level Environmental Impact Report/Environmental Impact Study (EIR/EIS), selected general track alignments and stations, and developed an institutional structure to manage construction and system-wide operations.

By a two-thirds vote in August 2008, California's Legislature approved AB3034 (Galgiani) to place a referendum on the ballot to commit the State to issue up to $9.95 billion of General Obligation (GO) bonds to support the system's development.[11] A similar bond measure had been scheduled for the November 2004 ballot, but was postponed twice.[12]

Three months after AB3034 passed, Prop 1A received 52.7% of Californian's votes. With the exception of the California Rail Association and the Howard Jarvis Taxpayers Association, there was little organized opposition. Prop 1A's advocates largely came from labor unions, engineering and construction companies.[13]

To date the Legislature has spent about $300 million on all types of work. This includes filings under the California Environmental Quality Act, detailed studies of right-of-ways and alignments, public relations consultants and the CHSRA's management and administration of their Project Management Team, Parsons Brinkerhoff. The CHSRA FY2011 budget request of over $400 million was lowered considerably. However the budget is under review again because in August 2010 the Authority proposed to have the Federal Railroad Administration (FRA) select one of four of the Phase I segments for a pilot program as opposed to its Phase I plan of LA/Anaheim to the San Francisco Transbay Terminal.[14]

CONCLUSIONS AND RECOMMENDATIONS REGARDING FINANCIAL RISKS ASSOCIATED WITH THE PROPOSED HIGH-SPEED RAIL PROJECT

At the close of September 2010, the Authority had both a $2.34 billion grant commitment from Federal ARRA funds and $194 million from the FY2011 Fiscal Christmas. If matched with bond financing authorized by Prop 1A of 2008, currently CHSRA has about $5.1 billion. That is not nearly enough to start construction on its $42.6 billion Phase I plan – LA/Anaheim to San Francisco. Nor is it enough to build one of the more expensive urban segments.[15]

The CHSRA's prospects for meeting AB3034's requirement not to require an operating subsidy are dubious. The prospect for gaining the full $18-19 billion of Federal grants has virtually vanished. Only with all of those assumed grant dollars can the CHSR hope to ever have a positive cash flow. California's counties and cities are struggling financially and are unlikely to be able or willing to find the $4-5 billion the project requires of them.

Twenty-three months after Prop 1A no private lenders have come forward with an arms-length proposal for the $10-12 billion earmarked from that source. To not have secured one private lender's commitment in a state that houses the world's largest and most successful risk capital companies speaks volumes.

Why the CHSRA finds itself in this predicament after spending over a quarter-billion dollars of State of California monies is answered by one word: credibility. The Authority successfully sold voters on a new mode of transport that would cost 'only' $33 billion and would allow them to travel in less than three hours from Los Angeles to downtown San Francisco at a cost of $55 for a one-way ticket. A year later the capital costs had risen by $10 billion and the publicly advertised ticket price was $105. Similarly, the financial model went from 'not costing taxpayers a penny' to the need for a legally prohibited subsidy, now called a revenue guarantee.[16] Those changes gnawed at the CHSR project's credibility.

Many rail experts had long questioned the plausibility of what the CHSRA was selling.[17] The next credibility gap came when hard questions were asked about the Authority's ridership model. To independent transport economists the forecast of 39 million annual riders for a *de novo* system in its tenth operating year

stretched beyond their imagined possible outcomes. Ridership forecasts on both transit and high-speed rail mega projects around the world are known to be overestimated, and most with serious financial consequences.[18] Since the CHSR must operate without a subsidy, the predictions should have been on the conservative side. To propose that four of every five Californians would ride the CHSR in 2030 is not plausible. Consequently, the CHSRA has faced challenges in both the popular and professional press for the credibility of their ridership forecasts.

CHSRA's ticket pricing assumptions were also scrutinized. We found that by using higher than publicly available price estimates for air transport and then pegging the CHSR ticket price at 83% of the average air ticket price, the CHSR model could always achieve a price advantage over air travel options. But these assumptions do not reflect the reality of personal or corporate budget choices, nor does the CHSRA's model reflect realistic choices for driving with several passengers. To achieve the forecasted ridership levels, the system would need more passengers and a cheaper per ticket cost. But assuming a higher than realistic airfare, and pegging the CHSR ticket at a percentage of that higher airfare is not a credible approach.

We know that every high-speed rail system in the world is subsidized. Only two segments worldwide, one in France and one in Japan, supposedly break even. By looking at the ticket prices for five routes in Japan, we found that the CHSRA's ticket pricing model used the same per passenger mile rates as Japan's Shinkansen system – $0.24/mile. The only supposedly break even French TGV segment, Paris-Lyon, charges $0.399/mile, two-thirds higher than the CHSRA's pricing model input. One might build CHSR, but in order to be profitable, ticket prices would have to be much higher – 80 % higher – and higher ticket prices mean fewer passengers will ride. Fewer passengers mean even less probability to operate without the prohibited subsidy.

Assumptions about the CHSR's revenues and operating expenses, coupled with their ridership forecasts, produced their projected operating surpluses – claimed to be $370 million in their first operating year, 2020. Since there is no publicly available edition of the CHSRA's financial model, we constructed one based on the same revenue and expense assumptions provided in their 2009 Business Plan. As the Authority did, we also focused on cash flows. Our model tells us that unless the full $18-19 billion is a non-repayable gift from the people of the United States, and the CHSR achieves 100% of its revenue and operating costs' forecasts, the project will never achieve positive cash flow. This finding stands in stark contrast to the Authority's

assertion of an operating surplus in its first year of carrying passengers and onwards.

Similarly, any other mix of bond or equity financing to cover a portion of the $18-19 billion will cause the CHSR project to accumulate negative cash flows with grim consequences for the State's treasury. Other forensic analyses of the CHSRA's finance statements showed that insurance, inflation, labor, maintenance and fuel costs were either poorly calculated or assumed to be minimal, in contrast to generally accepted accounting practices. Likewise, CHSRA treated all operating expenses as variable expenses, in contradiction of real world experience and standard accounting practices. These findings again stretched the credibility of the CHSRA's assertion that it would achieve an operating surplus.

Should the State Subsidize High-Speed Rail For The Public Good?

Some will ask, "Why shouldn't California subsidize the CHSR?" The obvious answer is that Prop 1A sold the project on the basis of no subsidy and AB3034 prohibits an operating subsidy. That is the law. Period.

Second, even in past times with good economic performance in California, the State ran a fiscal deficit. This has worsened during the Great Recession and no easy solution is in sight. State and local budget cuts have put many services, but particularly education, at risk. While California was once the envy of the world and its education system a major generator of prosperity, with a less-well educated workforce, State tax revenues from lower skilled labor who are paid less will decrease and business will have to turn elsewhere within or outside the US for skills. Raising taxes to close the fiscal deficit in a relatively high tax state risks the same results: fewer new businesses, fewer private sector jobs and less revenue for the State.

Any subsidy (or revenue guarantee) for CHSR must be paid for somehow. But the State doesn't even have the income to cover several prior years' or this year's budget. Any CHSR subsidy could only come from higher taxes or GO bond sales. The State's voters don't seem to be in the mood for a tax increase. And since private bond investors have put California on par with several Third World nations, more debt would make a subsidy expensive.[19] And a subsidy – or short-term revenue guarantee – once granted, is likely to live forever.

However, the point about the State's fiscally flagrant behavior is moot. AB3034 (Galgiani) disallows an operating subsidy. Prop 1A advertising promised the voters the system would make money, not lose money. The 2008 CHSRA Business Plan promised*, "an annual operating surplus of more than $1.1 billion*", clearly a sign of self-confidence.[20] The 2009 Business Plan downgraded that assertion but promised an operating surplus of $370 million in 2020, the first year the trains run, and four times that three years later.[21] The CHSR was supposed to make so much money that private investors should have stood in line to get a 'piece of the action'.

If those promises could be kept, there should be no worry. But nothing the CHSRA has released to the public, nor analyses done by consultants independent of the Authority's payroll has built confidence those promises will be kept. We find evidence that the project's construction is likely to cost much more than present estimates, ticket prices will have to be lower to be competitive with air and auto travel costs, and its operating costs and ridership forecasts are highly unrealistic. Conversely, if CHSR wants to have an operating surplus, ticket prices must be raised; but that will reduce ridership. The net result of these findings is that the CHSR will require a subsidy – which is prohibited.

What Would Be The Cost To The State If It Subsidized High-Speed Rail?

The Legislature and the Governor must approach the next steps on the CHSR project as investors – investors of California's wealth. This document's analyses reveal many ways in which the current CHSRA 2009 Business Plan is overly optimistic. Like a venture capitalist (VC) asking an eager entrepreneur for a forecast, we should not be the least surprised that CHSRA continues to err on the side of optimism, notwithstanding that the Legislature has demanded peer review, an investment-grade plan, and generally more rigorous financial analyses. In our hundreds of person-years of experience running businesses, we have only rarely had the sales team *beat* their forecast at the end of the year.

As long as the entrepreneur, in this case CHSRA, does the work, we can expect the same outcome. It is not surprising that the truly dispassionate analysts with no vested interest, such as UC Berkeley's ITS and the Legislative Analysts Office, should have been so much more critical of the plan than the CHSRA's own inside panels, consultants and Board. This happens every day in

the business world too. So we posited the question "What might happen if things go wrong for the CHSR project?"

A 'Low Case' Scenario Approach To Understanding The Impacts On California Of Underestimating Capital Costs And Overestimating Revenues. "Hope for the best but plan for the worst" is an expression heard frequently in VC and private equity boardrooms. So, if the CHSRA's business plan is the best case for the high-speed rail system, and its investors including the citizens of California, what is the low case? This part sets out and combines two 'low case' scenarios; one on the capital costs, ie the costs to build-out and equip Phase I, and one 'low case' on operations. These are not a "worst case" scenarios, which would be appreciably more dire. These 'low case' scenarios are based on real world experiences with cost overruns and revenue shortfalls. Section 5 discusses the implications of various mixes of financing and operating costs, and they all show cumulative peak negative cash flows between 2020 and 2035 in the tens of billions of dollars. The purpose of the following exercise is to generate an overview of the fiscal impacts not achieving the CHSRA's revenue and operating goals for this complicated financial situation.

Learning from a 'low capital build-out case' and subsequent debt finance costs. In Section 3 we noted that the worldwide experience with megaprojects is that they cost more, or much more, than estimated to build. The proposed rail system's regulator, the US Department of Transportation (DOT), estimates the average capital cost overrun is sixty percent. Given this is the first high-speed rail system in the US; the early evidence of litigation up and down the CHSR's proposed routing, and the high degree of technical complexity associated with running through so many built-out areas (rather than 'green-fields'), we might assume that CHSRA's capital cost overruns will be even greater than currently forecasted. This would probably be much less than Boston's Big Dig overrun (3.6 times estimates) and less even than the recent Bay Bridge rebuild (six times estimates); so as a 'low capital build-out case' scenario we believe a 100% overrun (1.0 times estimates) is a sensible analytical parameter.

How would the build-out be paid for? As discussed in Section 5, CHSRA assumes $18 billion in "free" money from the US Government, plus local funding, and additional private sector financing (presumably financed by the CHSR's profitable operations). The cost to California of debt payments will depend on this final mix of federal grant money, foreign government money on concessionary terms (not in CHSRA's plan but clearly on the radar), and whether private investors step in.

For the purposes of creating our 'low case' estimate, we assume no private investment for the capital (build out) budget. As cited in Section 1 CHSRA's consultants interviewed finance firms in May 2008 and found there was little appetite for this debt at that time without a guarantee from the State. In essence the debt becomes a State debt if you assume, as we have found, that the CHSRA's operations will not be a profitable train service (see 'Low Operations Case' that follows).

We do not distinguish between State bonds and local bonds – which the CHSRA does. We think it highly unlikely that local jurisdictions in today's economy can raise enough money to even make a dent in the CHSRA Business Plan's estimated $42.6 billion of build-out and equipment costs, even if they wanted to, let alone the estimate our model uses of $80 billion. But more to the point, for the California taxpayer, he or she is agnostic as to whether it is their city budget or their state budget that is encumbered with debt. They pay in both cases. The notion of sharing build-out expenses with localities may be appealing in Sacramento, but it's 'a wash' to the citizen. In fact, we judge that most citizens would rather lose State-provided services as a result of CHSR-induced debt expense than their local police or library services. We also believe it would be a gross blunder to assume that the current extremely low interest rate environment will exist for the next 10 years of build-out.

Here we describe the total debt payments that someone will have to make. CHSRA would argue that the robust cash flow from the operation of the CHSR will provide a significant portion of this debt payment. In our 'low operating case' scenario, and in Section 5, we foresee zero to marginal Operating Surplus, which means that there would be zero or only a marginal contribution from CHSR operations to the repayment and interest cost of the CHSR capital budget's debt.

The 'Low Build-Out Case' scenario and its implications for California. The assumptions used to understand the costs and implications of a 'low build-out case' scenario are:

a) a near-doubling the build-out cost estimate: from $42.6 to $80 billion build-out for Phase 1
b) we assumed 20% of the build-out capital is provided by grants and assumed certain concessionary features to the debt, but that this is all ultimately public debt (State or local)

Our first conclusion, based on using the same modeling as the CHSRA, but altering the build-out inputs with the above

assumptions, is this **'low capital build-out case' scenario would result in $64 billion in new debt** to be issued to complete building and equipping the CHSR project.

As a point of reference, **the total debt of the State of California was $68 billion as of August 10, 2010.**[22] This includes all outstanding bonds issued for all for all purposes (education, transportation, clean air and water, veterans, health care, stem cells, etc). Therefore, a 'low build-out case' outcome for the CHSR would nearly double the State's debt load to construct this one project.

Our second conclusion about the impact of a Phase I CHSR 'low build-out case' scenario is about the increase in the State's debt-service ratio. Our 'low build-out case' financial mix assumptions are:

a) 25% of the capital cost, or $20 billion, would be priced at market rates,
b) 25%, or $20 billion, is raised at concessionary rates; ie 50% of market rates
c) 30%, or $24 billion, is raised at market rates +75% (accounts for rising interest rates), and
d) 20%, $16 billion, is "grant" or free money.

We also attempt to stage the debt raise over 10 years.

Under these 'low build-out case" assumptions, **the total debt repayments and interest payments would equal $134 billion, or $4.5 billion of debt servicing costs per year for 30 years**, assuming a flat distribution for simplicity, as shown below:

Itemized Debt Servicing From A 'Low Build-Out Case'	
25% of the capital cost priced at market rates	$40 B
25% raised at 50% of market (concessionary loans)	$30B
30% raised at market +75% (for rising interest rate)	$64B
20% is grants or 'free' money =	$0B
Total debt and interest costs =	**$134B**

Simply servicing this debt (principal repayment and interest costs) would increase the State of California's Debt-Service ratio 60% – from today's already high 6.9% to close to 11%.

The 'Low Operations Case' scenario of the CHSR project and its implications for California. The CHSRA Operating Plan, although devoid of the kind of detail needed to independently construct an accurate Operations Expenses model, shows a very strong cash flow forecast that leads to a robust

Operating Surplus. Again, this must be treated as a 'high case'. And the CHSRA has already reduced its ridership forecast after certain flaws were pointed out. [23]

For a 'low operations case' forecast about operating revenues, we make the following adjustments:

a) Revenues are just 50% of what CHSRA forecasted and
b) Operating Expenses are 25% higher than CHSRA forecasted.

The reasons for these adjustments are discussed in Section 4. The CHSRA might argue that in a lower revenue model, the Operating Expenses variable should be adjusted downwards. However, lower revenue could result from fewer riders, or it could result from discounts on tickets, or both. Furthermore, operating expenses are highly unlikely to scale linearly. Whether the assumed private sector operator runs one train or a hundred a day, they still need to have customer service, maintenance operations, drivers on salary, and many other costs that are essentially fixed.

CHSRA's model also appears to overlook a large number of Operating Expenses, insurance and wage rises above the inflation rate for example. Intuitively the model seems to also underestimate Sales and Marketing expenses. For example, the CHSRA already has spent on public relations and does not even have a operating train to advertise ticket sales. For our purposes the CHSRA Operating Model does not have enough visible data to accurately and independently compute even their 'best operations case' scenario. But to make an estimate in which Operating Expenses run 25% higher than forecast and revenue grows more slowly seems like a reasonable approach for a 'low operations case' scenario.

In Year five of this first 'low operations case' scenario (2025) the CHSR Phase I operations generate about $1.28 billion (in 2009 dollars) in revenue and about $1.28 billion (in 2009 dollars) in Operating Expenses. This is roughly breakeven on a cash flow basis. This calculation is based on the Warren model, as discussed in Section 5. This breakeven performance becomes mildly positive over the ensuing decade. This means that while the CHSR operations may be at breakeven, they make no significant contribution to debt service. It also means that private equity investors will be unlikely to participate unless they can be convinced in due diligence that this 'low operations case' is too pessimistic, or unless the State of California guarantees a return on their investments.

A second way to generate a 'low operations case' cash flow forecast would be to assume that CHSR operations might generate 60% of its Operating Costs from the fare box. This is above what the DOT reports across the country for transit operations, that is fares pay for 40% of the Operating Expenses: but we use a 60% revenue generation target since the CHSR service is to be a premium service.[24] In our 'low operations case' we hold Operating Expenses constant, as does the CHSRA Plan, and revise revenues downwards; assuming either lower ticket prices, and/or lower ridership as the cause for lower revenues.

In Year 5 (2025) of this second 'low operations case' scenario, there would be $1.02 billion (in 2009 dollars) in operating expenses and $0.60 billion (in 2009 dollars) in revenue; leaving an Operating Deficit of $400 million.[25] This breakeven performance also becomes very mildly positive over the ensuing decade. But again this means there is no significant contribution to any debt service. Again it also means that private equity investors will be unlikely to participate unless they can be convinced in their due diligence that this "low operations case" is highly unlikely, or unless the State guarantees a minimum return for their investment.

Implications for the State from combining 'low build-out case' and the 'low operations case' scenarios. Many astute and experienced investors are among this document's Authors and Principal Reviewers. They know, and perhaps have learned the hard way, that failures happen even with good financial backing and the best possible management. In their practices they require entrepreneurs, like the CHSRA is for this totally new-to-the-USA rail system, to set up combined build-out and operations low case scenarios to understand what could happen if or when things don't go according to plan.

As one can see from looking at the two types of low case scenarios; servicing debt from the build-out is costly but would need be done without a contribution from operating revenues. Therefore, the combination of both low case scenarios could create significant negative impacts to the State of California's budget. With a negative cash flow of $4 Billion to $5 Billion every year for the next 30 years to service the costs of construction, and no 'Operating Surplus' to reduce the impact of these debt repayment requirements, the impact on the State's budget is massive.

Using the Warren model, as discussed in Section 5, we see that in the period between 2020 and 2035, that negative annual cash flow could reach a cumulative peak negative cash flow of $70 Billion to $80 Billion. Given the great difficulty the State has

raising taxes, and assuming that the State's leadership will not want to 'turn off' the CHSR's operations a few years after it is running, one is left to presume that the necessary subsidies in the combined low case scenarios will come from the General Fund. This would have to displace other spending. But as shown in this combination of both build-out and operation low cases, with higher than planned construction costs, 'turning off' CHSR operations would financially do no good. So much financial damage will already have been done by spending construction dollars that there is no way to repay the debt from a non-existent operating surplus.

A logical target of displaced spending could be other transportation services. But providing CHSR operations with that subsidy the State would have to significantly reduce spending for new or maintained roads, commuter rail, buses and other transportation systems. However, as no such subsidies are authorized by AB 3034 and Prop 1A, bond or taxation measures would have to be taken back to the voters to solve this CHSR cash flow problem.

PRACTICAL RECOMMENDATIONS TO BRING DISCIPLINE TO THE CHSR PROJECT'S FINANCIAL PLANS

As investors, the Legislature must act as the fiduciaries to the State and taxpayers of California. Independent reviewers of the CHSRA's ridership, revenue and expense assertions have asked enough serious questions and received no or vague answers that serious action needs to be taken soon. Every day hundreds of thousands of CHSRA dollars are funding studies, surveys and public relations efforts that are possibly the wrong priorities if the financial plans for the construction and operation of the CHSR are not realistic. It is the Legislature's responsibility to protect the financial well being of the State; and if the CHSR project is not financially sound, that responsibility is not being executed.

We offer four modest recommendations to bring more rigor into the strategic as well as practical aspects of financial planning for the State's largest infrastructure project.

First, slow the spending rate until the CHSRA has a credible financial plan. Much of the 'rush' of 2009-2010 has been predicated on the possible availability of free-to-the-CHSRA federal grants. Now that it is clear that fiscal issues have overwhelmed the Obama Administration the Legislature should recognize that the chances of ever getting $17-19 billion in federal grants is a remote possibility. We believe the CHSRA has

recognized this. Otherwise why would they have changed course in August 2010 and made separate applications to the Federal Railroad Administration for four separate segments and not the entire Phase I project? The reasoning behind the rush to gain federal grants before their application deadlines expire is now void.

In line with the need to more deliberately take stock of the question "Where is the CHSR project financially" is the need to compare the Authority's budget with what they now have to manage. If the Authority is to manage only one of the four segments that will be chosen by the FRA, why would they need the several hundred million dollar budget discussed in mid-2010? The CHSRA might need only a fraction of that. But to pay to continue studies of alignments up and down the state, and to finance statewide community outreach programs and public relations seems disproportional to the tasks of planning for one segment.

Second, the Legislature should immediately nominate and convene an independent peer review panel with deep financial expertise. SEC. 2. Section 185035 of the Public Utilities Code demands a peer review panel, but none has sat in deliberation. AB3034 says the Treasurer is to nominate two members, the Controller two, the Director of Finance one, and the Secretary of Business, Transportation and Housing nominates one. While four of the six-person panel are elected officials' nominees, the Treasurer and Controller, and only two are nominated by the Governor's appointees, the Legislature is not represented at all. It seems curious that neither the Senate nor Assembly committees responsible for transportation or budget are able to exercise fiduciary oversight on a project this large, and on which they have no representation.

Since there has been no peer review panel meeting, the Legislature should establish its own, through its appropriate committee structure. That panel would be independent of the Governor and should have a budget large enough to do serious work including its own research staff and administration. And that panel should convene and develop an agenda focused on the CHSR project's finance in an expeditious and professional way.

Third, bring in a high-speed rail builder and operator to advise the Legislature on the financial realities of building and operating a system. We hope it is common sense that the entrepreneur who wants money from an investor does NOT have an incentive to make low forecasts. But most

often they succumb to what has been called 'optimism bias'. The sales team always thinks they are going to hit a home run. On the other hand, we know that our 'low case' analysis will be criticized as biased or uninformed.

If the Legislature and Governor share our concerns that perhaps CHSRA is ignoring the potential downside risks, then it may be appropriate to insist that CHSRA find a private sector Operating Partner who would be prepared to invest their capital in this plan, or else help craft a plan the private sector can believe in and get behind. We could feel that there was more discipline being brought to the financial plan and forecasts. At present, the only "skin in the game" is the California taxpayers' and that of their children's future – and with the federal grants, Americans in general.

The Legislature needs to insist that CHSRA find a credible potential Operating Partner and ask this Operator to develop a business model for the operation. While this is still not ideal since, with no investment at stake, the private operator will not bring the same discipline to the analysis as would someone about to invest their money, at least it would create the sort of dispassionate analysis that we would do as private sector investors.

Fourth, California and its municipalities should contain the growing financial risk and stop funding for the CHSR project. The environment for raising debt financing for California is clearly going to be tougher, likely limiting California's ability to market its bonds while raising the cost of servicing new debt. This is a time some economists are calling 'The New Normal' where California's political leaders and citizens need to make priorities about what can be afforded by State's taxpayers today and tomorrow. As discussed in this report, the CHSR project clearly does not meet the legislated standard of not requiring a subsidy. Therefore it does **not** merit funding on an absolute, stand-alone basis.

It also does not make sense to fund the CHSR project on a relative basis in the context of the State's other, more pressing needs and existing liabilities. Arguments by the CHSRA that the debt contemplated by their business plans is a worthwhile risk for the State to assume based on the California-based jobs that the project purportedly will create are tenuous if not facetious. The limited number of *net new jobs* that CHSR will create for Californians is overstated, as discussed in Section 7. And as discussed in detail in Section 5, the benefit of such few jobs pales in comparison to the demonstrated downside financial risks posed by to the State's financial future.

In summary what every California voter should be asking themselves and their elected representatives in Sacramento and Washington? At least two relevant questions should be in the public arena.

> What reasonable milestones exist to make realistic Go/No Go determinations in order to guard against continuing to waste desperately needed State funds on a project that might become partially completed; un-financeable, inoperable, and stranded?
>
> How much planning, public outreach and design expense will be consumed without sufficient committed financing to complete the optimistic $42.6 billion required to bring Phase I to operational status?

This is a dangerous time for the CHSR project since its assumed financing sources have not materialized. The Federal grant funds and AB3034-initiated GO bonds, if buyers for those bonds can be found, bring the project's available capital to about 11% of what it needs for Phase 1. But there are no known local government and no private sector monies in the project at present. New federal grants will be a fraction of the Obama Administration's FY 2010 bold plans. The CHSRA could be desperate for funds to keep their project alive and the temptation to promise more than the law allows high. Without the money, and with diminishing confidence in the CHSRA's plans, this becomes a dangerous time to risk the State of California's financial future.

1.0 BROKEN PROMISES AND UNMET DEMANDS FROM THE LEGISLATURE DIMINISH THE CHSR PROJECT'S CREDIBILITY

During the course of promoting high-speed rail for California, and afterwards in its planning, the CHSRA made certain promises to Californians and were required by the Legislature to complete certain tasks. The following eleven items describe how CHSRA has come up short on meeting its promises and the demands of both the law (AB3034) and the Legislature.

1.1 The CHSR Project That Voters Chose In 2008 Promised To Link Seven Cities, But Links Only Three

Although San Diego, Riverside, Oakland and Sacramento were part of the official ballot description for Prop 1A, what emerged after the vote as Phase I is only for Los Angeles/Anaheim to downtown San Francisco.[26] While the official ballot description promised connections to seven metropolitan areas, Phase I links only three.[27] The promise to connect seven cities, given to California's voters by CHSRA proponents and repeated in the CHSRA's 2008 Business Plan (submitted after the ballot) was broken.[28]

1.2 The Prop 1A $33 Billion Capital Cost Promise Morphed Into A $42.6 Billion Capital Cost

The Federal Railroad Administration (FRA) is the CHSRA's benefactor and regulator and the two have worked together for years. In December 2009, the capital costs of Phase I, not the entire system as proposed in Prop 1A and the 2008 business plan, increased by thirty percent. While there were some new capital elements, the CHSRA attributes most of that $10 billion increase to having to meet FRA rules that capital expenses must be calculated in the year of expenditure, thereby accounting for inflation.

Two questions remain unanswered between 2008's capital cost promise and the 2009 cost estimate. First, since the 2009 project was only for a portion of what was promised in 2008, why didn't the cost estimates decrease instead of increasing? Second, if FRA and CHSRA have worked together for years, why didn't the CHSRA use the FRA cost estimate guidelines in the run up to AB3034 and Prop 1A?

1.3 The Promised $55 One-way SF-LA Ticket Morphed Into A $105 One-way Ticket After Prop 1A

Voters were promised they could go between the state's metropolises for about $50.[29] That sounded like an inexpensive way for families and the budget-minded to travel between SF and LA. Yet, thirteen months later the one-way fare estimate had increased ninety percent. And the fare is unlikely to decrease. With the State's Attorney General increasingly aggressive about companies' price promises not reflecting their final prices, the Legislature might ask when the CHSRA knew the ticket price would increase.[30]

1.4 Five Months Before Prop 1A Passed, The Authority Knew That Private Sector Participation Was Conditioned On Near Total Federal And State Capital Building The CHSR Project

In May 2008, near the peak of the worldwide credit bubble, CHSRA had the Infrastructure Management Group (IMG) survey private sector firms' interest in helping finance the project. Thirty firms and individuals – builders, equipment makers, financiers and operators responded. Only five of the firms were from financial institutions – Babcock & Brown, Carlyle, Goldman Sachs, HSH Nordbank, and Meridiam. IMG and Lehman Brothers compiled, reviewed and analyzed the data.

Five months before Prop 1A passed, the Authority's Board heard the survey conclusions. [31] In that June 2008 Board presentation, CHSRA learned that all the operators and equipment manufacturers, and nine out of ten builders, were reluctant to invest unless a large portion of the capital costs were from State and Federal sources; *"Nearly all RFEI respondents noted that they would be unlikely to commit the resources necessary to participate in a procurement of this magnitude until after strong financial backing for the Project was provided by the public sector."* In other words, 'off-load all the project's capital risks onto the public and we'll come aboard'. This doesn't seem consistent with the Authority's later claims of support for public private partnerships (P3).[32]

1.5 Five Months Before Prop 1A And Three Months Before AB3034 Passed, The Authority Learned The Private Sector Would Only Operate The CHSR If Given A Revenue Guarantee

In the same June 2008 presentation, IMG reported that private firms were reluctant to take risks based on the Authority's then-ridership forecasts; *". . respondents argued that interest in equity investment would increase if the risk to the concessionaire*

were decreased, perhaps through some form of revenue guarantee . ." This mention of the need for a subsidy, the first of four in that presentation, is most dramatically shown on top of a table as "Public Funding/Guarantees" in the IMG report.[33]

Therefore, nearly five months before Prop 1A went to the voters, the Authority knew the CHSR P3 participants wanted public monies to cover nearly all the capital costs. And they knew the then-$33.6 billion project would need a revenue guarantee to attract private equity and operators.[34] Despite the CHSRA's later claims of thirty private firms' expressions of interest, the Authority knew when AB3034 was under deliberation, that private sector participation was conditioned on a forbidden subsidy – aka a revenue guarantee.[35] If the CHSRA Board knew in mid-2008 of the problems of attracting private participation in both CHSR's capital funding or operations, why wasn't the Legislature aware of this major missing element to the project's feasibility prior to passing AB3034?

1.6 The CHSRA Did Not Meet The Senate's Demand For An Investment Grade Business Plan Prior To The 2008 Proposition 1A Vote

While debating AB3034, both the Senate and Legislative Analyst's Office (LAO) called for an investment grade business plan by September 1, 2008.[36] CHSRA submitted its 2008 Business Plan shortly after the November vote on Prop 1A.[37] Only six of that Plan's thirty-two pages addressed capital and operating costs and sketched out possible mixes of public and private finance.[38] That *sine qua non* of public and private investing is still absent, despite the demand in AB3034 that such be presented to the Legislature by September 1, 2008. [39]

1.7 CHSR Proponents Promised Prop 1A Voters The Project Would Pay Its Way; But By Mid-2008 The CHSRA Knew The State Would Have To Guarantee The Operators' Revenue

Part of what sold voters in 2008 on Prop 1A was that the project would not depend on the government after they approved the $9.95 billion bond authorization. Proponents promised "*THE USERS OF THE SYSTEM PAY FOR THE SYSTEM"*; that is riders, not taxpayers, would pay for the system.[40] But the June 2008 presentation by IMG showed that none of the then-expected $6.5-7.5 billion from the private sector would be forthcoming. The thirty surveyed builders, equipment makers, operators and financiers essentially said 'no private capital for construction and no participation unless we are guaranteed an income by the government.'[41] All five of the operators who participated in the

survey were very clear about this point.[42] If the operators weren't willing to risk their firms' futures on the data supplied them in the May briefings and survey, that is a good indication they didn't believe the CHSR project would at least break even. And in June 2008, IMG told the CHSRA this result. Why the operators' distrust of the promise of a profit for operators wasn't passed on to the Legislature prior to the vote on AB304 remains unanswered.

1.8 Despite The Senate's Demand, CHSRA's Business Plans Have Still Not Met The Criteria Or Quality For Investment Grade

Thirteen months after Prop 1A's passage, the Authority submitted its 2009 Business Plan on a project of more than $40,000,000,000. In sixteen pages of text and summary tables, the CHSRA made no reference to spread sheets, or how results were calculated. The Senate seemed less than satisfied with the Plan's vagueness, *"The business plan of the HSRA points to the risk that the project may not be found creditworthy by banks or private equity funds. …the HSRA correctly acknowledges, but does not discuss, some of the critical risks involved for both government and private sector funding."*[43] The Legislative Analyst's Office was less circumspect, citing fifteen deficiencies of that 2009 Plan to address either financing sources, assumptions or risk mitigation techniques.[44]

CHSRA's answers to these criticisms were in an April 2010 Addendum.[45] Shortly afterward, the State's Auditor found significant problems both with the way CHSRA managed its funds and the Authority's assumptions concerning the system's funding sources.[46] Since then, little has been done to expand publicly available information or clarify finances for the CHSR project.

1.9 A Year After AB3034 Passed, IMG Again Told The Authority That Private Sector Financing Would Only Become Available With A Revenue Guarantee

Eighteen months after the IMG's survey, in a September 2009 IMG-Goldman Sachs workshop, the CHSRA Board learned:

> *"Private appetite for ridership risk is limited without revenue guarantee or until ridership proven*
> *Potential for substantial* ***non-recourse financing is likely to be limited*** *to the Anaheim-San Francisco section, based on forecast of operating surplus (emphasis theirs)*
> *It is unlikely that a private partner will take ridership risk at this early juncture "*[47]

That presentation goes on to point out a logical fallacy. It says *"Earlier this year, the Board adopted San Francisco to San Jose, Merced to Bakersfield, and Los Angeles to Anaheim as "stimulus sections . . While none of these sections are forecast to generate significant operating surplus to attract P3 financing, vendor financing may be available for rolling stock and core systems requirements"* If each of those segments are not able to generate an operating surplus to attract private capital, then how can the sum of those segments – presently Phase I – generate an operating surplus and avoid a subsidy?[48]

Supposedly, and without reference to how this would happen, additional financing would be provided for the other segments in Phase I, ie San Jose to Merced, Bakersfield to Palmdale, and Palmdale to Los Angeles. If that happened the entire corridor could be built and be operational by 2020. This would then allow the forecasted ridership to occur between San Francisco and Los Angeles/Anaheim; thereby producing an operating surplus. To any investor, these preconditions represent insurmountable risks without a guarantee of income. That is what CHSRA knew fifteen months before the September 2009 presentation.

1.10 Although Twice Demanded By The Legislature And Promised Before September 2010, CHSRA Has Not Produced A Risk Mitigation Plan

Any business seeking investors must address financial risks – and offer remedies to each identified. The investors' fiduciary responsibility is to perform due diligence on such a proposal. Without that investigation they stand liable to shareholders. For them it is essential to ask, "What specifically is Plan B if one or more assumed variables in Plan A fails?" The Legislature foresaw this need in 2008, and Section 185033 of California's Public Utilities Code, i.e. AB3034, demanded that the Authority's "*business plan shall also include a discussion of all reasonably foreseeable risks the project may encounter."*[49]

A technical memorandum was all that constituted a risk management plan in the 2008 plan. When finally submitted after Proposition 1A was passed, it was not acceptable even to KPMG, the Authority's auditor contractors.[50] This should have 'raised flags' in the Legislature that something was seriously amiss.

When no such risk mitigation strategy was forthcoming in the 2008 plan, the Legislature instructed the Authority once again that its 2009 *"business plan should be modeled on a financial prospectus of the type that is required to be prepared for investors in new stock or bonding offerings."*[51] It was to address

the types and level of risk the State of California would be assuming for the CHSR project.

The Legislative Analyst's Office (LAO) commented on the 2009 Plan: *"To avoid the risk of failing to win credit approval from investors, the Authority's strategy is to 'clearly communicate the project and obtain up-to-date feedback'."*[52] The LAO said of the 2009 risk strategy, *"The Authority plans to avoid the risk that governments are not able to follow through on their commitments 'by carefully assessing how each government funding source affects the build-out of each segment'."*[53]

Four months later, in April 2010, the Addendum to the 2009 Business Plan stated that mitigating risk *"will require on-going communications efforts with the financial markets,"*[54] and the "*Authority needs to continue to monitor the federal budget process.*"[55] It further stated, *"To mitigate state risk, the Authority needs to monitor both the State's [sic] overall financial situation and its continued ability to sell GO bonds."*[56] The Authority's risk mitigation plan *"can be summarized to be as flexible as possible on which segments it funds and when."*[57]

The Amended Plan repeats the same 'communicate and monitor' approach found wanting by the LAO in the December 2009 document. Monitoring and communicating are not mitigation. There is no outline of what the Authority will do in case one or more financial source fails to provide part or all of their funding. In short there is no 'Plan B' in any submission or amended submission by the Authority. Despite promises to have quantitative risk analyses done in 15-18 months (June - September 2011), to date it is impossible for private investors – on whom the project depends for $10-12 billion – to perform their due diligence.[58] And it is impossible for the Legislature to exercise reasonable fiscal prudence without a risk mitigation plan.

1.11 Despite The Demands Of AB3034 More Than Two Years Ago, No Independent Peer Review Group Has Reviewed And Assessed The CHSRA's Financial Plans

AB3034 and Section 185035 of the Public Utilities Code, demand the CHSRA establish an independent peer review group that, among other tasks would review the finances for the project and each segment of the project. The law clearly requires " *. . the authority to establish an independent peer review group for the purpose of reviewing the planning, engineering, financing, and other elements of the authority's plans and issuing an analysis of appropriateness and accuracy of the authority's assumptions and*

an analysis of the viability of the authority's funding plan for each corridor."[59](emphasis added) The peers were to include a representative from a financial services or consulting firm and to have reported to the Legislature no later than 60 days after receiving the Authority's business plans[60]

The CHSRA website documents a peer review, done ten years ago (2000) by the French national rail carrier (SNCF), Japan Railway's Technical Services (JRTS) and DE Consult, a Berlin-based engineering company controlled by DB, the German national rail company.[61] No report on their findings is available and none of these companies are considered financing experts.[62] Moreover SNCF, JRTS and DE Consult have potential conflicts of interest as their parent companies are in the business of building and operating high-speed rail systems.

The CHSRA also mentions a pre-Prop 1A peer review by the Metropolitan Transportation Commission (MTC) but confined its focus to the ridership model with a "*panel comprised of local, national, and international travel model experts to provide an objective and independent review of the modeling assumptions, methodologies, and results*". The CHSRA web site does not say a report was issued. Nor does CHSRA mention any financing expertise on the MTC panel.[63] Although the Senate has once again called for an independent peer review, none had been convened by early October 2010, more than two years after it was demanded by AB3034.

2.0 CHSRA'S RIDERSHIP FORECASTS – CENTRAL TO THE FINANCIAL OUTCOME – ARE FAR TOO OPTIMISTIC

At the heart of any financial forecast for a high-speed train are two issues: how many riders will there be, and what each is expected to pay. The CHSRA added on to those the benefits of job creation. Ridership, price and job creation forecasting techniques are not an exact science. However, one should expect that plausible estimates be made on the basis of surrogates or prior experience. The Authority's ridership assumptions drive many of our questions on financial sustainability.

2.1 Evidence-Based Analyses Contradict CHSRA's Forecasts

Perhaps the first alarm that something was questionable about the ridership forecasts on which CHSR income projections were based was the 2008 assertion that about 94 million riders annually would board the CHSR by the system's completion date in 2020.[64]

Since California's population in 2030 is projected to be about 46 million, that CHSRA ridership forecast suggested that every man, woman and child in the state would ride the train at least two times each year, whether they lived near or hundreds of miles from a CHSR station.[65] This 2008 CHSRA ridership projection for its tenth operating year constituted slightly less than one-third of the 2008 United States population.

Even a year later, when CHSRA downward-adjusted its 2030 ridership number to 39 million, something still seemed amiss. The U.S. experience with accelerated rail service is telling. In 2009, about twenty years after its inception, the combined ridership on all segments of the Boston-NYC-PHL-WDC Acela route was 3.02 million.[66] Acela draws riders from combined metropolitan populations over 28 million, attracting about 11% of the residents of its market catchment area.[67] If the CHSR were to achieve after a decade what Acela has attracted in a generation, it might draw 11% of all of California's residents – about 5 million, not 39 million riders.

CHSRA claims that population and employment growth in California will *"increase interregional travel by 65 percent to 911 million trips a year . . .including a nearly five-fold increase in conventional rail trips"*.[68] Even starting from the miniscule basis

of California's interregional rail trips today, such a percentage increase is difficult to understand.

2.1.1 CHSRA's forecasts don't account for technology changes that are diminishing commuting and business travel.

Nowhere do the Authority's ridership forecasts account for relative downward shifts in commuting due to technologies such as telecommuting, video conferencing, etc. These technologies have increased productivity and lowered capital costs, with fewer dollars spent on space for offices, office equipment (HVAC, office furniture, etc) and parking areas. Today, fewer and fewer corporations have 'fixed' offices for their sales forces, or dedicated workspaces for those who spend only part of their time at a 'home' site. And because fewer on-site employees require less office space, these innovations have also decreased operating expenses through lower utility bills, lower physical plant maintenance charges, and fewer administrative support and security personnel.

Likewise, such technologies have already decreased both short-haul and long range business air travel, even without the presence of high-speed rail. Business travel represents the second or third largest operating expense for many medium and large corporations. Corporate finance officers are keen to see that expense category decrease in relative importance. Relatively fewer business trips per employee also suggest that the CHSRA's extrapolation from the growth of air and auto-based travel over the past few decades may itself be a logical fallacy. Both commuting and business travel are undergoing radical changes. Deploying these new technologies – regionally and globally – is and has been a priority. But nowhere does the CHSRA report on this shift in paradigms about where and how work gets done.

Nor does the Authority address the ramp-up of corporate social responsibility – shown in the annual reports of Cisco, Symantec, Intel, etc – to decrease the environmental impacts of business travel by all modes. This includes the growing importance of hybrid and soon-to-be electric autos as part of Californians' options. To assume Californians will travel to work in autos or vans with today's mileage and at dramatically increased percentages in an age of telecommuting and environmental sensitivity is a questionable proposition.[69]

2.1.2 The CHSRA's ridership forecasts also fail to take into account the absence of a history of rail travel in California or the impact of low population densities on use of the CHSR.

These urban geography factors could easily make or break the system. The only train currently operating between the two metropolises (San Francisco and Los Angeles) is an Amtrak coastal route service, a leisurely and partly scenic ride, but not one that has generated enthusiasm for train travel. More importantly, any successful rail system depends on significant densities per square mile to help its fare box revenues. While much can be said about the importance of trains and high-speed trains in Europe and Japan, those nations' densities per mile are higher than California's. In Japan, density is 880 people per square mile; it's 653 in Britain and 611 in Germany. By contrast, plentiful land in California has led to suburbanized homes, offices and factories. Density in the Golden State is 236 per square mile.[70] Thinking that safer, faster and reliable high-speed rail will attract riders is not the same as actually getting them out of their autos or reducing their need to use autos once they arrive at a CHSR destination.[71]

2.1.3 CHSRA's forecasts fly in the face of real world evidence of actual versus forecasted ridership.

Actual experience with high-speed rail ridership forecasting is also instructive. Flyvbjerg, Bruzelius and Rothengatter stress the lack of reliability of those forecasts: *"(rail) forecasts were overestimated on the average by 65%."*[72] Using the average 'overshoot' from the prior forecasts analyzed by those authors suggests the CHSR should attract about 11 million riders in 2030, its tenth operating year, not 39 million as the CHSRA forecasted.[73]

Eurostar's actual versus projected ridership through the Channel Tunnel provides further perspective. In 1992, the Eurostar Business Case Forecast projected *"15 million passengers per annum in 1995 and growing".*[74] In 2009 Eurostar carried 9.2 million passengers, only 60% of what forecasters said it would carry at its start fourteen years earlier.[75] In *Megaprojects and Risk*, Flyvbjerg and colleagues conclude, *"Rail passenger traffic forecasts are consistently and significantly inflated."*[76] The World Bank's recent report on high-speed rail concluded that, *"High-speed projects have rarely met the full ridership forecasts asserted by their promoters, and in some cases have fallen woefully short. A whole new area of behavioral research has been generated by the phenomenon of over-forecasting in transport, known as 'optimism bias'."*[77] Whether the CHSRA's forecasts are the result of optimism bias, poor modeling methods

or some unstated motive, their published results need more critical scrutiny than the Authority has been willing to concede.

2.2 Independent Experts Refute CHSRA's Ridership Model

Forensic analyses by a macro-economist and two transportation planning organizations have brought to light possible reasons for the divergence between CHSRA's ridership forecasts' and other model builders' findings and methods.

2.2.1 Findings from Californians Advocating Responsible Rail Design (CARRD) on CHSRA's ridership are disturbing.

In late 2009 and early 2010, statistician and macro-economist Elizabeth Alexis of Californians Advocating Responsible Rail Design (CARRD) analyzed why the CHSRA ridership model seemed to disproportionately favor a Pacheco Pass routing. What she and other CARRD members found was also applicable to the general CHSRA ridership model.

After repeated attempts to obtain what was supposed to be publicly available data, Ms. Alexis secured a visit to the SF Metropolitan Transportation Commission (MTC). She later stated*, "CARRD recently made a site visit to MTC and was able to obtain what are believed to be the actual headways [time between trains] used in the analysis . . . . It is clear, however, that the headways in the publicly available documents are NOT those used in the ridership study."*[78]

Other concerns expressed by CARRD concerning the ridership model include:

- *Sampling issues: There were only 27 long-distance commuters surveyed, which resulted in a decision to constrain the long distance commute market to the same coefficients as the business model.*
- *Reliance on stated preference data for main mode choice model: Stated preference data has known issues that bias estimation results. Because of this, the study design specifically stated that both revealed preference and stated preference data would be used. For some reason, only stated preference was used. In the calibration process, this resulted in very large mode specific constants that highlight the bias that in fact was present in the study sample.*
- *Frequency coefficient: The frequency coefficient was arbitrarily constrained to be the same as the time coefficient."*[79]

In late January 2010 CHSRA's Deputy Director, Jeff Barker emailed CARRD the final coefficients, along with a surprise -- a transmittal memo from George Mazur of Cambridge Systematics (CS). The CS memo placed direct blame on the MTC for

withholding these documents from the public for the prior thirty-three months and said: *"The client, MTC, elected not to update the Task 5a report nor to include the final coefficients and constants in the final project report."* This is a remarkable assertion for Cambridge Systematics. The final coefficients and constants were substantially changed from those peer reviewed and published. The revised coefficients and constants never had been seen by the public. Nor, according to CHSRA, had they been seen by the CHSRA's internal peer review group. Mr. Barker continued *"... this material as presented did not previously exist and significant amounts of sub-consultant staff time went into preparing it."*[80]

Why the data provided to the public were different than used in the CHSRA model, why various coefficients were changed, and why stated preference data were used inappropriately are serious questions that have yet to be answered. These answers should be in the public realm before the State provides further funding for the CHSR project.

2.2.2 Smart Mobility's work challenged both the CHSRA model's methodology and findings.

Later in the spring of 2010, Norman L. Marshall of Smart Mobility Inc, a transport planner with 25 years experience, provided expert testimony in which he challenged the CHSRA's model. He claimed the variables available for the ridership peer review were not the same as those later used and published by the CHSRA. Specifically Mr. Marshall said:

1) *The model coefficients used in developing the ridership and revenue forecasts are different from those disclosed to the public during the environmental review period;*
2) *The final frequency (headway) coefficients used in developing the ridership and revenue forecasts are invalid;*
3) *The use of these invalid frequency (headway) coefficients biases the alternatives analyses in favor of the Pacheco alignment (Pl) as compared to the Altamont alignment (Al);*
4) *Mode-specific constants were misrepresented during the public review process;*
5) *The mode-specific constants in the final model that were used to forecast ridership and revenue are invalid.*[81]

Mr. Marshall concluded, "*The California high-speed rail ridership and revenue forecasts used in the selection of a preferred alignment were based on modeling that was misrepresented and invalid."*[82]

2.2.3 The ITS-UC Berkeley review and report should have made those responsible for fiduciary aspects of the CHSR project suspend its funding.

In April 2010, after a critical report by the State Auditor of the CHSRA's operations and funding assumptions, the Senate Transportation Committee empowered the Institute for Transportation Studies (ITS) at UC Berkeley to analyze the CHSRA's model.

At the end of June 2010, the ITS reported, "*The forecast of ridership is unlikely to be very close to the ridership that would actually materialize if the system were built. As such, it is not possible to predict whether the proposed high-speed rail system in California will experience healthy profits or severe revenue shortfalls.*"[83]

Other problems highlighted in the ITS-UC Berkeley report include the use of inappropriate data at inappropriate points in the Cambridge Systematics (CS) model. For example the ITS says the CS model used:

- *A sample of long-distance travelers that was not sufficiently representative, and of a statistical method to adjust for that difference that has since been proven unreliable*
- *Statistical adjustments that were valid for intra-regional ridership models, but not for inter-regional ones, thereby exaggerating the importance of having frequent service*
- *A structure that predetermines which high-speed rail station travelers will choose rather than allowing travelers to make the choice themselves*
- *Restrictions that were based on professional judgment instead of on observed data*"[84]

At the July 2010 CHSRA Board meeting, Professor Brownstone, representing the ITS-UC Berkeley review, criticized the sampling procedures used in the CS projections and the failure to include a potential error range in the estimates. He said such methods have *". . caused, I think, a lot of problems when it turns out later on the actual ridership is way off from the forecasts. This is a problem with almost all existing work*."[85] Lance Neumann, President of Cambridge Systematics, emphatically supported the methods and results in the ridership forecasts and stands behind the projections "without reservation."[86] The CHSRA Board declined to seriously question the methods or results of their consultant's ridership forecasts.

At best, the Cambridge Systematics (CS) model's output is not reliable for such a large investment in the CHSR. Tens of billions

of dollars will be risked based on a forecast that is counter-intuitive, and that doesn't agree with common sense or with empirical and historical analyses. Nor are the CS methods in accord with recent professional methods and standards of rail transportation model experts not dependent on the Authority. It is dangerous to continue to assume the CHSRA model's outputs are not inflated and that they can be used to support financial due diligence.

3.0 CHSRA'S ESTIMATED PHASE I CAPITAL COSTS SHOULD BE SIGNIFICANTLY HIGHER

Megaprojects are notorious for cost overruns, and the CHSR is probably no exception. Within a year, CHSRA increased its Phase I, pre-Prop 1A cost estimate of $33 billion by thirty percent – to $42.6 billion. CHSRA claims most of the extra $10 billion was due to Federal Railroad Administration (FRA) demands that costs be inflated to their estimated value in their year of expenditure.

CHSRA assumes three percent annual construction cost inflation during the 2012-2020 build-out of Phase I, which is in line with manufacturing construction cost rises over the past seven years.[87] However, that assumption might not stand, as the CHSR will *"create the equivalent of 600,000 full-time, one-year jobs over the course of its construction"* between 2012 and 2020.[88] If these jobs are located in California, the project would surely increase local demand for materials and workers, stimulating inflation. While no one knows what Phase I construction inflation will be, the Authority did not assume the impact would be above average while continuing to assert the project's job creating virtues. The assumption that construction inflation would be the average of the last few years is certainly questionable.

3.1 Megaproject Histories Show Costs Were Substantially Underestimated

However difficult it may be to forecast increased prices for Phase I, hard evidence illustrates how much a high-speed rail system's estimated costs can go askew. Some examples:

The Channel Tunnel – *"Total investment costs for this originally privately financed project were estimated at GBP 2,600 million (1985 prices). Upon completing the project in 1994 actual costs had turned out to be GBP 4,650 million (1985 prices) resulting in a cost overrun of 80 percent"*[89]

This financial history should make private sector investors pause. Share prices, originally at GBP3.50 in 1987, rose two years later to GBP11.0; then fell to 65p in 2001, a loss for investors at the peak of between 95% and 80% from the opening price.

Germany's Intercity Express (ICE) – The high-speed rail between Cologne and Frankfurt was also to be a private for-profit system. Originally estimated to cost DM5.4 billion, then

DM7.8 billion, then DM10 billion, the net result of almost twice the estimated costs meant fewer passengers due to higher ticket prices. The cost for the Nuremberg-Munich link of ICE was originally estimated at DM3.8 billion, but ended up being about DM5.4 billion. The final costs for these sections of ICE were 42% to 85% higher than their original estimates.[90]

US Department of Transportation – A DOT study of transit projects in 1990 concluded the median of total cost overruns for ten rail projects was 61%, ranging from -10% to +106% of the original estimates.[91]

3.1.1 Construction cost escalation is likely to be higher than assumed and jobs not likely to come before 2012.

The wage inflation impacts of such a surge of construction workers is difficult to estimate. However, they would probably increase the CHSRA's cost estimates above their universally assumed 3% per annum. The proposed system will need professional high-speed rail design, estimation and construction expertise; the proposed system's operators will need skills that don't exist in California or the US. Foreign-owned companies such as Parsons-Brinkerhoff, the CHSRA's current project management contractors, will need to import these types of workers, at best only partially alleviating California's unemployment problem.

While we can sympathize with construction workers suffering from high unemployment rates, hiring probably won't begin until construction starts, which is planned to begin during 2012. By that point, the US economy probably will be growing again, and construction unemployment decreased. That will put wage pressure on construction estimates; a danger if builders or operators require cost-plus contracts. We also wonder about the purpose of using ARRA monies if unemployed construction workers have to wait for two more years to work?

These findings from actually building large projects, not estimates by engineering firms, should cause financiers and Legislators to pause and ask probing questions about the underlying assumptions of the CHSRA's financial models.

3.2 The Costs Of Phase I Of The CHSR Project Could Fall Between $62 Billion And $213 Billion

In the absence of cost histories for US high-speed rail projects, we must turn to surrogates.[92] Figure 1 gives a few examples of overruns in construction megaprojects. [93]

Figure 1			
Megaproject Name	Estimated Costs ($Bs)	Actual To Date ($Bs)	Actual as a Multiple of Estimated
SF-Oak Bay Bridge	$1.3	$6.4	5
Boston 'Big Dig'	$4.0	$14.5	3.6
Dever Int. Airport	$1.7	$5.0	2.9

In their seminal survey of 210 transport mega-projects (27 rail, 183 road), Flyvbjerg, Bruzelius and Rothengatter found that *"For rail, actual costs are on average 45 percent higher than estimated costs."*[94] A look at what the range of possible overrun costs might imply is sobering. Figure 2 shows what the Phase I of the CHSR (presently estimated at $42.6B) costs would be if it were to increase like that of other, real world examples.

Figure 2 If CHSR Phase I Overran Its $42.6B Forecast Equal To Findings By The Cited Source – Then CHSR Phase I Would Cost	
Source Or Project Name	
1. Flyvbjerg *et al* Study	$61.8 billion
2. The DOT 1990 Study	$68.5 billion
3. The Channel Tunnel	$76.7 billion
4. Germany's ICE (CGN-FRA)	$92.4 billion
5. Denver International Airport	$123.5 billion
6. Boston's 'Big Dig'	$153.4 billion
7. Oakland Bay Bridge	$213.0 billion

Some may argue that project costs estimates have improved. Engineers have computers, previous histories have established benchmarks, and planners are more cautious about prices than in the past. But Flyvbjerg *et al* conclude *". . . cost overrun has not decreased over time. Cost overrun today (2003) is in the same order of magnitude as it was ten, thirty or seventy years ago."* [95]

The consequences of cost overruns on the finances of a project of this size can be devastating; particularly true for a project that in 2008 declared that ""*The current financial plan assumes that an annual operating surplus of more than $1.1 billion . .*"[96] While a year later the Authority decreased its estimated operating surplus to $370 million in its first operating year, it increased the estimated surplus to $1.5 billion in its third operating year.[97]

The history of cost overruns does not bode well for these CHSRA claims. Other governments have suspended interest payments, refinanced the projects, stretched out private sector operators' bond payments, and extended the operators' concessions. However, those options are not available to CHSRA; since according to the provisions of AB3034, they would be considered a prohibited operating subsidy.

4.0 CHSRA'S REVENUE ASSUMPTIONS ARE TOO HIGH AND ITS OPERATING EXPENSES TOO LOW

Ticket sales will constitute nearly all of CHSR's revenues. If tickets were free or nearly so, we could safely assume that more people would choose high-speed rail than if costly. When the Authority changed its assumptions on ticket prices from 55% to 83% of the average airline ticket price between Los Angeles and San Francisco, ridership estimates for the tenth year of operations (2030) fell from 94 million to 39 million.

In 2008 the Cambridge Systematics' (CS) ridership model proposed 94 million riders for 2030, although a model prepared in 2000 by Charles River Associates had proposed only 34 million riders.[98] A year later CS had dropped the 2030 estimate from 93 to 39 million riders when the ticket price assumption for the CS model for one-way LA-SF ticket increased from $55 to $105. Clearly, higher fares thwart ridership.

The CHSRA ticket price is not computed from an operating and capital cost basis, or from a large-scale random sample survey of what a wide spectrum of potential riders in different places would pay for air, auto or high-speed rail. It is based on unproven assumptions with dangerous financial impacts. The Authority assumed that ticket prices would be less than both airlines' fares and automobile transport between the two major metropolitan destinations, and used those assumptions to build its ridership forecasts. The lower the price, the more riders.

But more riders riding cheaply would require higher operating costs, so ticket prices must still be high enough to keep the system with an operating surplus, since no subsidy is allowed. Here the CHSRA's pricing model faces a conundrum: to seek a balance between attracting enough riders and a price that will produce an operating surplus, but not deflect riders to other transport modes. A lower ticket price will gain riders but not meet the legal mandate to not require an operating subsidy. A higher ticket price could perhaps make the CHSR financially sound, but will in turn divert price-sensitive riders – families, tourists, business travelers – to travel by other means.

4.1 CHSRA Used Inflated Auto And Airfare Prices To Capture More Riders and Revenue

William Warren, in a model of the Authority's financial plan

shown in Appendix A, has concluded that the way the CHSRA's prices were constructed results in an unrealistically high $72 average ticket charge for both interregional and shorter-distance travel. This CHSRA assumption, geared to 83% of the average airline fare, makes annual revenues stronger than they might otherwise be by using inflated base data on airline fares and auto operating costs.[99]

By using actual airline ticket prices and reviewing how the Authority's automobile trip costs were determined, Mr. Warren calculated more realistic prices for air and auto travel. He then applied the CHSRA's 83% rule – that CHSR prices would be 83% of the price of competitive alternative transportation modes – to those more realistic costs. Warren's work concluded, *"CHSRA's planned prices will need to be reduced at least 25% to reflect the competitive market's actual pricing and costs."*[100]

To put it another way, in order to get the market share the CHSRA says the high-speed system can get at 83% of the competition's prices and costs, the train's fares would average only about $50 per ticket, not the $72 per ticket selected by CHSRA's consultants. That decrease in revenue, a risk not counted in their analysis, would do serious damage to CHSRA's revenue assumptions and therefore their ability to operate without a subsidy. This is because, while the price per ticket would drop, the operating costs per ticket would not decrease. Higher operating expenses coupled with lower ticket prices equals financial trouble. This pricing analysis was incorporated in the financial analysis discussed in Sections 4.1.3 and 4.1.4.

In its Addendum to their 2009 Business Plan, the Authority recognized that airlines can and do drop their prices when facing economic downturns or competition. The Organization for Economic Co-operation and Development (OECD) also recognizes this: *"Low-cost carriers might respond to the emergence of a high-speed rail alternative by increasing the frequency of service. A similar improvement on the rail side would be very costly given the cost of trains, and this would reduce rail's market share and profitability."*[101] But CHSRA did not incorporate this new (to them) finding into their ticket-pricing model, which appeared a year before and has yet to be altered.

Since CHSRA does not know what its real ticket prices are to be, high-speed rail is vulnerable to a price war, one that Southwest, United and other airlines can cross-subsidize in California through other domestic or international fares. A mid-2010 television advertisement by Southwest Airlines offers a peak season one-way SF-LA ticket at $49 ($54 with taxes and fees).

It is difficult to see how high-speed rail, whose one-way ticket price assumption is 83% of the LA-SF airfare, ie $105.00, would be able, as claimed in the Addendum, to cut prices and meet its expenses without a prohibited operating subsidy.[102]

The Authority assumes the cost of an automobile trip between the two metropolises – representing 95-96% of all trips – is $118.[103] The probable cost is somewhere between $70-$85 counting depreciation, maintenance and operations of the auto. While it is not clear how many passengers the Authority assumed per vehicle, it was probably only one. If that were the case, then the high-speed train would have to compete with trips being made by groups like families in vehicles with three to six occupants. In those cases, the marginal cost of another passenger is small, perhaps $10-$15 per trip. For a family of four traveling the same route, the probable total cost by auto would be less than $160, while even using the CHSRA's fare assumptions, high-speed rail tickets would be more than three times that amount.

4.2 If CHSRA Had Used An Evidence-Based Pricing Approach To Be Financially Sustainable, Ridership Would Have Decreased

One way to look at how much the CHSR must charge to be profitable – as opposed to attracting riders – is to compare actual subsidized or unsubsidized fares in Europe and Japan with what the Authority proposes. In their 2009 Business Plan, the model input on pricing for a one-way SF-LA ticket had increased to $105.[104] For the 432-mile distance of the planned Phase I route, the average per mile charge would be $0.24.

Since there are no high-speed rail systems in the U.S. of the type envisioned by CHSRA, surrogates suggest what a ticket should cost to make the system financially self sustainable. The closest 'cousin' in the USA is public transit, where on average 'fare box' collections represent about 39% of operating costs.[105] While these are regional or city transit systems and not strictly comparable, the evidence that, on average, the taxpayers have to subsidize riders by about 60% of the operating costs suggests that, despite the CHSRA's claims and AB3034's demands, the system will require a subsidy.

Throughout other parts of the world subsidized high-speed rail fares are the norm. Iñaki Barrón de Angoiti, the Director of High-speed Rail at the International Union of Railways (IUR) said that, with two exceptions (Paris-Lyon and Tokyo-Osaka), high-speed routes are subsidized worldwide.[106] Practically every high-speed rail system is subsidized since those two routes alone do

not generate enough revenues to carry their entire high-speed rail systems. Subsidies – whether only operating costs or operating and capital costs – may come in the form of pre-purchased tickets for government employees, free or subsidized capital investment, debt cancellation, or some other means. Or, as in the 2009 case of Eurostar, the EU approved a UK Government subsidy of $7.9 billion because of poor economic conditions.[107]

Evidence on whether a subsidy is only for operations, or covers capital servicing as well as operations, is so thin that we decided to disregard whether a system is subsidized or not, and look at actual ticket prices per mile to understand what other systems charge. A look at five inter-city rail examples of one-way fares, translated into the one-way 432 mile SF-LA journey, suggests approximately how much the CHSR must charge per mile to possibly break even.

1) Using the Shinkansen's average price of $0.24/km, or $0.384/mile, a one-way HSR ticket for the 432-mile SF-LA trip would be $165.89.[108] There is some evidence that the Shinkansen received capital subsidies.[109] The World Bank says of Shinkansen's passenger mile costs, "*In Japan there is a surcharge for high-speed rail which doubles the fare on conventional services.*"[110]
2) An economy level ticket on Germany's Intercity Express (ICE) from Frankfurt to Berlin is $168 for that 269-mile trip.[111] At the ICE per mile rate of $.6245 per mile, the 432-mile SF-LA trip would be $270.
3) Spain's high-speed rail, the AVE, charges $153 for the 390-mile Madrid-Barcelona trip.[112] This fare rate is $0.392/mile, suggesting a LA-SF ticket price of $164.47.
4) Italy's high-speed rail system (Trenitalia) charges $122 one-way for the Milan-Rome 296-mile route.[113] If that $0.41/mile rate were applied to the 432-mile SF-LA route for the CHSR, the ticket price would be $178.05.
5) Data from the Paris-Lyon TGV route, one of two segments that Iñaki Barrón de Angoiti claims is profitable, are telling.[114] A second-class seat on the Paris-Lyon TGV is $115, and the land distance is 288 miles.[115] The ticket rate per mile on this TGV segment is US$.399/mile. Using the same per mile rate for the one-way LA-SF trip would imply a fare of $172.50.

Using the empirical evidence from high-speed train routes in Japan and Europe, it appears that California's high-speed rail per mile rate should be about 80% higher than presently used in the CHSRA's ridership and financial models. This average of nearly

$0.44/mile – making a one-way SF to LA ticket price of about $190.00 – may bring the proposed system closer to financial sustainability than their present model input of $0.24/mile.

Harvard urban economist Edward Glaeser calculated that operating expenses alone for high-speed rail vary between $0.10 and $0.50/mile. Using his average of $0.30 per mile, $.06 per mile more expensive than CHSRA uses, for the 432 mile LA-SF route would suggest a fare of $130 per passenger.[116] But even this would not cover any debt servicing costs -- not the State's $9.95 billion bonds dedicated to the CHSR, nor the $4-5 billion from cities and counties if not grants, nor any of the $10-12 billion expected from the private sector. The need to service debt in the CHSR project precludes using the assumed $.24/mile assumption of ticket cost.

4.2.1 The CHSRA cannot have it both ways -- lower fares and no operating subsidy *AND* financially sustainable fares and fewer riders.

The Warren pricing analysis, shown in Appendix A, from actual air ticket and auto costs suggests the SF-LA fare should be at least 25% lower to maintain the 39 million riders. Yet the above evidence-based high-speed fare analysis implies that ticket prices have to increase about 80% to reach the legal requirement to break even financially.

An increased per-mile rate would wreak havoc on CHSRA's ridership forecasts. What CHSRA's modeling might produce is unknown. However, if we use the impact of the Authority's fare increases between 2008 and 2009, with its decreases in ridership between 2008 and 2009 we learn a great deal about what actual ridership may be. The 2008 forecast of 94 million riders decreased 58% (39 million) with a 90% increase in the SF-LA fare ($55 to $105). If the financially sustainable one-way SF-LA ticket price of $190 (a 80% increase) were to follow this same linear relationship, ridership would fall about 42%. That pragmatic mathematics suggests CHSRA ridership in 2030 would be about 16 million, or only 40% of the Authority's projection of 39 million riders that year. And that calculation is dependent on believing the near-mythical projection in 2008 of 94 million riders. Something has to be done to put the Authority's pricing model on a realistic footing.

4.3 CHSRA's Assumptions On Operating Expenses Do Not Reflect Real World Practices

In the CHSRA's operating expense plan, no distinction is made between fixed and variable costs. The CHSRA 2009 Business

Plan treats almost all costs as variable and directly linked to their projected ridership figures. This is fallacious. Two examples: the fixed cost of running a train from Los Angeles to San Francisco does not depend on the number of riders on that train. Nor is the frequency with which trainsets must be maintained dependent on the number of riders. Investment grade accounting must recognize this difference between fixed and variable costs and incorporate them in the model. To date there is no indication that the CHSRA's financial plan recognizes this crucial point.

Once construction is finished, operating costs and debt servicing take over. The history of projecting these kinds of costs is improving, but not yet good. A dated DOT study concluded that operating costs for rail transit systems are, on average, 80 percent greater than expected.[117] A more recent study found that transit operators had greatly improved their forecasts of operating costs, but actual costs for some heavy rail systems, like Atlanta's MARTA, were still twice their planners' estimates.[118] Compared with other public transit modes, operating costs per passenger mile on America's intercity passenger rail lines are three and a half times higher than for airlines and four times greater than for intercity buses.[119]

To be financially responsible, the assumptions of the CHSRA's 2009 Business Plan should have erred on the side of caution and assumed operating expenses would be larger than expected. A Transportation Research Board report estimated the operating costs of the now defunct Texas TGV at nearly 70 percent higher than the CHSRA's operating cost projections.[120] There is even contradiction between the CHSRA's claims about operating costs and those of the U.S. Federal Railroad Authority (FRA), an important regulator of California's CHSR project. "*The operating cost per seat mile from the FRA study for the California corridor (2006$) is approximately 40 percent higher than that of the CHSRA projections*."[121] This significant difference should give pause to the FRA and others who are considering financing the project.

Details in the CHSRA's 2009 Plan show some glaring examples of understated or missing operating expenses. For example, by its fifteenth year of constant operation, the CHSR's equipment maintenance costs should be significantly higher than the average per year and increasing due to cumulative wear and tear on the rails, the carriages and the overhead electric grid. Speed costs. However, the 2009 Plan says, *"Thereafter, from 2023 ($1.01 billion) through 2035 ($1.07 billion), a span of 13 years, operating costs are projected to be essentially flat."*[122] The

CHSRA plan holds equipment maintenance costs constant for thirteen years at approximately 42% of total operating costs. As a paper by private investor Alan Bushell [Appendix C] points out, *"Assuming that all costs from 2023 through 2035 will be almost constant when expressed in 2009 dollars and that all operating costs experience the same average rate of inflation runs counter to past experience."*[123]

The Bushell paper on operating costs, Appendix C, also notes well-documented facts such as, *"Medical insurance and fuel will be major cost items for a system such as this. In the past twenty years no business operation has been able to successfully contain these two expenses to anything near the general rate of inflation."*[124] Medical expenses and medical insurance costs alone increased at about twice the CPI rate, and fuel costs (as inputs to electrical generation) have kept ahead of the CPI for over two decades. To assume otherwise is to ignore history.

Other operating cost omissions in the CHSRA's Plan were property, casualty and liability insurance. The Authority says, "*Insurance is assumed to be handled by the Authority and the state in the initial phase, through an owner-controlled insurance program (OCIP)."*[125] Again, Bushell points out that assets *"will need to be insured even if self insured, and there are costs associated that need to be revealed. . . . and no mention is made with respect to whether liability insurance is 'handled' also means that unlimited cost will be absorbed by some entity other than the HSR system itself."*[126] Such costs of doing business are universally recognized as corporate operating expenses, but the CHSRA doesn't clarify who will pay for these in their proposed operations.

4.3.1 CHSR operations will incur security costs, still missing from CHSRA's business plans and operating costs.

One aspect of Prop 1A's appeal to voters was the implication that HSR passengers would avoid the extra time and inconvenience of airport security systems. But a high-speed train is a high visibility target, as acknowledged by the airport-like security on the Paris-London Eurostar.[127] However, security costs were not mentioned in any of the CHSRA's business plans. Excluding these costs ignores both the 2004 terrorist attacks in Madrid and the following year's in London. To thwart such attacks takes considerable capital investments such as security cameras, sensors on tracks, bridges, trenches and tunnels. It also requires operating costs, including personnel to train and manage staff engaged in passenger boarding security checks and those monitoring and maintaining the security technologies. These costs have added time and financial burden to airline

passengers; it is unwise to assume they won't be part of the costs of operating California's high-speed rail system.

4.3.2 CHSR is unlikely to keep union labor rates from inflating or work rules from punishing productivity.

Finally, and most salient, labor will be the single largest operating expense for high-speed rail, probably accounting for about half of its total operating cost. Most likely, employees will be unionized, with collective bargaining rights and the ability to cripple CHSR by 'sick outs' or walk outs and demands for higher wages and benefits.[128] Federal laws governing labor-management relations will restrict the ability of the operator to increase productivity. For example, current union work rules specify that most Amtrak employees cannot perform tasks outside their enumerated work duties for more than two hours per day. And while Amtrak executives have sought to expand this to four hours per day, the unions have held firm.[129] The history of Amtrak is replete with Congress' frustrations in trying to bring the system's unions under control. All efforts have failed. This year Amtrak's union managed to get a 15% raise over the next five years, astonishing during the Great Recession.[130] There is no fundamental reason to believe the CHSR operator will be able to withstand union pressure on wages, benefits or work rules.

5.0 USING THE CHSRA'S DATA ON REVENUES AND EXPENSES, THE SYSTEM WILL NEVER ACHIEVE POSITIVE CASH FLOW WITHOUT THE ASSUMED FEDERAL GRANTS

5.1 The Warren Financial Model Highlights What Taxpayers Will Have To Bear

Absent the basic information that would be in an investment grade business plan, William Warren, a former executive of several Silicon Valley companies, reviewed and built a surrogate CHSR project financial model.[131]

The Warren model and accompanying explanations of its findings are Appendix B. His model's baseline revenues, capital and operating expenses are taken from those in the CHSRA's 2009 Business Plan for the period 2010 to 2035. This approach shows the potential impact before reviewing any of the CHSRA's Business Plan's numbers, as is done in other sections of this report. And like the CHSRA's results, the Warren model focuses on when and how much cumulative positive or negative cash flow the project will produce.[132]

The Warren financial model, like the CHSRA's Plan, is a cash flow analysis model. Cash left over, or cash required to break even from operations, is counted by both models as an Operating Surplus (or deficit). Neither model is a Profit and Loss statement. For example, the CHSRA plan does not take an annual depreciation charge. Instead CHSRA starts a Capital Replacement Fund in the eleventh year of operations to accumulate enough funds to replace the rolling stock starting in the fifteenth to twentieth years (2035-2040). This Capital Replacement Fund is also accounted for in the Warren financial model.

The Warren model also goes several steps further than either CHSRA's model or a basic cash flow analysis done by CARRD in May 2009.[133] It considers the cash flow implications of various mixes of grants, debt and equity on the CHSR's financial performance as well as its impacts on the State of California and its taxpayers. Additionally, it allows for sensitivity analyses on two variables; changes in prices and changes in ridership.

There is, however, a fundamental difference between the CHSRA's 2009 financial point of view and the Warren model's point of view. Both assume Federal grants do not have to be

repaid. But the CHSRA model assumes their organization is not obligated to service debt on the project; that is 'laid off' on some other entity: namely the State of California. Solely for calculations purposes, the Warren model assumes that California's taxpayers will be responsible for paying for any hidden subsidy (aka a revenue guarantee) and to service possible private, Federal, state, or local loans or equity positions.

As shown in Figure 3, five clear findings emerge. The various results are based on the key (and possibly illegal) assumption that private debt/loans and the private equity investments will be guaranteed a rate of return, as defined in the 2009 Business Plan.[134] The result of this requirement is that cash contributions to "Sinking Funds" will be needed every year to allow for the scheduled retirement of debt/loan obligations, and to allow for the repurchase of the equity investment plus the agreed upon rate of return.

Figure 3
Economic Impact on the State Of California Of Different Funding Cases And Different Operating Results For The Period 2020 to 2035

	Mixes Of Finance Sources		
	Mostly Grants As Per '09 Plan	More Debt Than Grants	Mostly Private Debt and Equity
Revenues & Costs As A % Of 2009 Business Plan	– – – – – – – Billions of $s – – – – – – –		
	A	B	C
Case 1–100% of 2009 Business Plan	($4)	($14)	($25)
Case 2–75% of Ridership and Op Expenses	($9)	($25)	($35)
Case 3–Ticket Price Is Down By 25%	($16)	($32)	($43)
Case 4–75% of Ridership and Op Expenses **AND** Ticket Price Down By 25%	($22)	($38)	($49)

5.1.1 Even under CHSRA's most favorable financing scenario, the State is likely to be liable for $4–25 billion of shortfall in CHSRA's cash flow.

First, we explore the three results in the first row of Figure 3. As Case 1A shows, without the full $19 billion of interest-free, not-repayable Federal grants, there is little chance the project will ever be financially viable on a cash flow basis, much less produce a long-term cumulative positive cash flow. This is based on using the results stated in the CHSRA 2009 Business Plan, i.e.

100% of the revenues, ridership, and operating costs for the 2020 to 2035 time period.

For the taxpayers of California, even the most favorable scenario of full federal funding has a negative cumulative cash flow that peaks at over ($4 Billion). This point is shown in Case 1A, the first row of the 'Mostly Grants' column. This point also stands in direct conflict with the CHSRA's assertion that the project will produce a net operating surplus from cash flow of $370 million in its first year of operations since the CHSRA model does not speak to the impacts of financial obligations.[135] The Warren model shows the CHSR is not able to meet AB3034's demand to not require an operating subsidy. [136]

As it is extremely unlikely that the 'Mostly Grants' scenario (Case 1A) will occur (gaining $19B in Federal grants), it is important to understand the outcomes of the other two scenarios (Case 1B and Case 1C) in the top row. In Case 1B, the 'More Debt Mix' case, more Federal loans and private investment are assumed while a smaller amount of Federal grants are assumed. In Case 1C, called 'Mostly Private' monies, Federal Grants are limited to $4.5B. For Case 1C, $29B in Private Debt and Equity is assumed to provide the bulk of the required financing. As one moves from the 'best-for-CHSRA' scenario (Case 1A) on the left side of Figure 3, with a peak cumulative negative cash flow of $4 billion, to the Authority's 'worse' case on the right, Case 1C, the peak cumulative negative cash flow grows to $25 billion.

5.1.2 A simple 'stress test' of decreasing ridership by 25% (and an equal decrease in Op Ex) shows the State's liability increases even further.

Second, the Warren model adds a stress test by examining the risks of reducing fare-based revenues and operating expenses by one-fourth. The results of even this favorable-to-CHSRA scenario, Case 2A with a 25% revenue and expense decrease, show that the proposed project can never create a positive cash flow for the State of California. And if the mix of financing decreases Federal grants, as in Case 2B and Case 2C, the cumulative negative cash flow increases to $25 billion, then $35 billion (2C). This feature of the Warren model analyzes a risk scenario, a crucial element of financial due diligence, demanded by the Legislature, but not yet produced by the CHSRA.

The Warren model grants the CHSRA the assumption of simultaneous and equal revenue and operating expense reductions solely to maintain consistency with the CHSRA's assumptions. However, the model's author recognizes that in day-to-day practice, reducing operating expenses by 25% within

the same time frame as a 25% revenue reduction is an impractical assumption, except over protracted periods.

Third, these first six scenarios in Figure 3 (Cases 1A to 2C) mix various levels of debt financing with equity financing in order to understand the impacts of various types of debt obligations the State might have to assume. This even more comprehensive analysis shows that the State's treasury would never accumulate cash from the CHSR project if any funding scenario other than the CHSRA's most favorable scenario (Case 1A) occurs —because in Case 1A, the negative peak cumulative cash flow is reduced to zero by 2033. Therefore, without the $19 billion of Federal grants, the high-speed rail project has almost no chance to ever have a positive cash flow when viewed from the point of view of California's taxpayers.

5.1.3 If ticket price inputs had been more realistic than the CHSRA Plan assumes, the State could be liable for a $16-43 billion of cash flow shortfall.

Fourth, the Warren model offers even more insights into risks by analyzing the price per ticket assumptions in CHSRA's 2009 Business Plan. This test was developed as part of the pricing analysis discussed in Section 3.1. In Appendix A the author analyzed more accurate and current (2010) airfares between the San Francisco Bay Area and Los Angeles metro area and automobile operating costs on a per passenger basis. This analysis shows that the projected per passenger ticket HSR prices in the 2009 Business Plan ($105 each direction) need to be reduced by 25% to achieve the market penetration that is targeted in that Plan, and simultaneously achieve the volume of passengers in the Plan.

When the Warren model is used to look at the consequences of a 25% reduction in per ticket prices, with 100% of the passenger boarding volumes and operating costs – shown in Figure 3 cases 3A, 3B and 3C – there is a major increase in peak cumulative negative cash flows, as revenues are reduced, without a reduction in operating costs. These results of the "best" scenario Case 3A results in $16B of cumulative negative cash flow, and the "worst", Case 3C of $43B of cumulative negative cash flow.

5.1.4 Assuming the risks of both fewer riders and lower ticket prices increases the State's liability to nearly $50 billion.

Fifth, the Warren model can then be used to measure the consequences of combining two major factors – as shown in Figure 3 cases 4A, 4B and 4C. These factors are 1) the need to reduce "the per ticket prices" by 25% (as shown in the third row,

cases 3A, 3B, and 3C) to be competitive in the marketplace, and 2) simultaneously having passenger volumes only achieve 75% of their Plan forecast, (as shown in the second row, cases 2A, 2B, 2C). [The model still grants CHSRA the unrealistic assumption that operating costs can be reduced by 25%.] The results of this combination of the second row and the third row are shown on the fourth row. Changing the mixes of financing shows a dramatic increase in peak cumulative negative cash flows, with a "best" scenario (Case 4A) result of $22B of cumulative negative cash flow, and a "worst" case result of peak cumulative negative cash flow of $49B.

When one looks at the details behind the numbers in Figure 3 one sees that only in Case 1A, the ($4B) peak cumulative negative cash flow could possibly be paid off by 2033 so that by the end of 2035 the State of California has no outstanding loans, or subsidies, to the HSR Authority. In all of the eleven other cases, these subsidies required to keep the system operating will still be outstanding. And it is reasonable to assume that the monies spent on these subsidies will never be recovered.

There is an additional risk case that needed to be quantified. The Warren Model can also be used to understand the consequences in cost over-runs during the period of construction, of 2012 to 2020. If, for example, the $43B that is projected to be required to construct the Phase I corridor from San Francisco to Los Angeles/Anaheim, and to purchase the trains sets, grows by 20%, to $50B, each of the negative numbers in Figure 3 can be increased by an additional negative ($14B). While not addressed, the consequences of even higher construction costs on cumulative negative cash flow are even more dire.

5.1.5 If California guarantees the debt and equity obligations needed to cover CHSRA's revenue shortfalls, the State would be in the untenable position of violating AB3034; but if 'at risk' equity replaces 'fixed return' equity as the major equity finance vehicle, equity owners end up with a miniscule or negative return on their investment.

Finally, the previous discussions are based on a key – yet presently disallowed – assumption that the returns to the private debt and private equity investors are, in effect, guaranteed. If the position of the private equity investor were one of an 'at risk' return rather than a 'guaranteed' return, the implications for the State of California finances should be significantly less negative.

If the private equity investor is also the operator of the system and that entity's return of its equity capital, and any return on this equity could be defined to be all of the cash available in the HSR's cash accounts, on a certain year, such as 2035 or 2045, the amount of the subsidy required by the State of California would drop significantly. For example, in Figure 3 the amounts in the left hand column – Scenarios 1A, 2A, 3A and 4A – would drop by $11B. Column's B's losses would drop by $15B. And if 'at risk' equity capital replaces all guaranteed equity capital, Column C's losses would drop by $29B. In effect, all three of Row 1 and one of Row 2 cases would be cash positive by 2035.

However, it seems unlikely that any operator or investor will agree to a condition of putting their equity 'at risk', as the Internal Rate of Return the operator/equity investor will achieve, based on the cash available in 2045 will be, at the most, 9% to 7 %. And as shown in Figure 4 (Column B and Column C) in many cases, it will be negligible or negative. This does not look like an attractive investment opportunity if compared with the guaranteed internal rate of return of 10% for the "Fixed Return" (guaranteed return) equity investor, which was assumed for calculating the sums in Figure 3.[137]

Figure 4
Internal Rate of Return For The 'At Risk' Investor's Investment Based On An 'All Available CHSR Cash In A 2045 Total Payout

	Mixes Of Finance Sources		
	Mostly Grants As Per '09 Plan	More Debt Than Grants	Mostly Private Debt and Equity
Revenues & Costs As A % Of 2009 Business Plan	– – – – – – – Billions of $s – – – – – – – A	B	C
Case 1–100% of 2009 Business Plan	9%	7%	5%
Case 2–75% of Ridership and Op Expenses	8%	5%	2%
Case 3–Ticket Price Is Down By 25%	6%	-0.50%	-4%
Case 4–75% of Ridership and Op Expenses **AND** Ticket Price Down By 25%	4%	worse than -5%	worse than -5%

5.1.6 If The CHSR Project Continues, The State Of California Is On The Horns Of A Financing Dilemma.

If the State government provides a 'fixed return' (i.e. guaranteed) to the equity investor, and the private debt and equity investors provide a substantial portion of the capital required to build the system, as shown in Figure 3, column C, the State of California's subsidies to a CHSR project would be in the tens of billions of dollars.

On the other hand, if the State provides no guarantee, and stays with the 'at risk' return that AB3034 demands, then for private debt and equity investors, who provide a substantial portion of the capital required to build the system (Figure 4, column C), the rate of return for these equity investors (Cases C1 and C2) is minimal, at best. If Figure 4 Case C3 or Case C4 occurs, the investors' rate of return is negative; that is, they will never recover even their initial investment.

Why is this happening? The root of the problem is that as the source of financing moves in Figure 3 Column A, with $19 billion in Federal 'free money' – without interest and not paid back – towards Figure 3 Column C, where a substantial portion is private debt and equity which requires paying investors, the negative cash flow cannot be serviced by the operating margins projected in the 2009 Business Plan.

Herein lies the State's conundrum. If the equity return is 'guaranteed' the cumulative negative cash flow is very large, as seen in Figure 3, and the investors are happy with their investment. However the taxpayers are subsidizing the return of the investor's capital and its interest and dividends – clearly forbidden by AB3034. However, if the equity return is at risk, the amount of the negative cash flow is reduced by about $30B in Figure 4 Column C, as discussed in Section 4.1.5, but the remaining cash left as a return to the investor is extremely poor if it exists at all.

It's not clear this dilemma can be solved. The requisite operating conditions in the 'best case' (Case 1A) are that the CHSR must attain 100% of its ridership forecasts and ticket prices while keeping operating costs within the CHSRA's estimates. As already argued, this is unlikely to happen. Even if those conditions were met, a great deal of Federal 'free money' over the next 10 years is required, as Figure 4 Column A shows. Without perfect knowledge of both of these 'best-for-CHSR-conditions' occurring (i.e. Column A financing and Row 1 operating results), the odds of financial success, as measured by no need for an operating subsidy (or revenue guarantee) and

from the point of view of California's taxpayers, are very small, if not zero.

5.2 High-speed Rail Systems Do Not Break Even

All forms of public transportation require subsidies. Whatever the ticket prices, per mile costs are generally more, and sometimes far more, than collected at the 'fare box'. A 2004 US DOT study found that rail and mass transit are considerably more subsidized by the Federal government on a per passenger-mile basis than other forms of transportation. DOT found that subsidies for various public transport modalities, using year 2000 dollars, are as follows:[138]

Figure 5
DOT Findings On Tranport Subsidies (Yr.2000 $s)

Mode of Transport	Subsidy per 1,000 passenger miles
Intercity Rail & Mass Transit	>$100
Aviation	appx $10
Intercity Buses	appx $4

Highway transport actually more than pays its own way due to gasoline taxes. In contrast, federal rail passenger subsidies increased nearly 50% between 1990 and 2002 (the last data year of the study), while commercial aviation subsidies decreased nearly 20% in that period.[139]

Projections about high-speed rail's ability to make a profit depend on non-US evidence, since there is no US high-speed rail of the type proposed in California. To repeat, in 2009 Iñaki Barrón de Angoiti, Director of High-Speed Rail at the International Union of Railways (IUR), said, *"Only two routes in the world — between Tokyo and Osaka, and between Paris and Lyon — have broken even."*[140]

The CHSRA and California's high-speed rail supporters claim their system will be profitable. But even the subsidized Acela operator disagrees with that claim. In April 2008, Amtrak's Inspector General said *"When all revenues and expenses for the entire passenger train system are taken into consideration, European Passenger Train Operations operate at a financial loss and consequently require significant Public Subsidies."* [141] The study of six European nation's operations showed their annual rail subsidies to average $42 billion. This ranged from Germany's high of nearly $23 billion annually to Denmark's low of $900

million. And the operators employ off-balance sheet accounting, the same financial engineering techniques that helped bring the Great Recession. As a whole, each year (1996-2006) $26 billion of the $42 billion subsidy was on the operators' balance sheets, but nearly $ 16 billion was off-balance sheet accounting.[142]

Then in December 2009 the US Congressional Research Service (CRS) reinforced the IUR Director and Amtrak's Inspector General's statements: *"Experts say that virtually no HSR lines anywhere in the world have earned enough revenue to cover both their construction and operating costs, even where population density is far greater than anywhere in the United States. Typically, governments have paid the construction costs, and in many cases have subsidized the operating costs as well."*[143] While repeated in both their 2008 and 2009 business plans, the CHSRA's claims of profitability are contrary to worldwide experience.

Legerdemain aside, those knowledgeable about rail systems both here and abroad were skeptical of the CHSRA's promises in 2008 and 2009 to make profit. An independently-produced due diligence report, released prior to the Proposition 1A vote, put the point about subsidies another way*: ". . . to claim that HSR systems are not subsidized when much of their capital costs (and perhaps even operating costs) are paid for by government is akin to claiming a household budget produces a surplus without including the mortgage on the house*."[144]

In July 2010 a World Bank report cautioned against assuming high-speed rail systems will be profitable or require no subsidies: *"Governments contemplating the benefits of a new high-speed railway, whether procured by public or private or combined public-private project structures, should also contemplate the near-certainty of copious and continuing budget support for the debt."*[145] These sources – DOT, IUR, Amtrak and Word Bank – of empirical, independent evidence should be impossible to ignore.

The Authority is forbidden by AB3034 to require an operating subsidy. Its projection of a $370 million operating surplus in the first year of CHSR operations should be evidence that no subsidy would be needed.[146] However, the need for a `revenue guarantee' of limited duration appeared five times in the Authority's 2009 Business Plan.[147] Despite assertions to the contrary in the Authority's Amended Plan, a revenue guarantee is a commitment by the State of California to subsidize the shortfall between income and expenses. Once started, this subsidy will be extremely difficult to reverse after the proposed CHSR system is built and operating.[148]

While the name may change, a revenue guarantee is in effect a subsidy, and a disincentive to operate in an efficient and effective manner. AB3034 is the law and must be obeyed in both letter and spirit. To ignore the potential impacts of a continued shortfall of revenues in the model is inconsistent with risk analysis in an investment grade business plan.

Promising the Legislature and the people of California that the high-speed rail system would not require an operating subsidy was necessary in order to promote the CHSR system to Prop 1A voters in 2008. To reiterate that promise a year later using a financial model that forecasts a $370 million operating surplus in its first year was misleading.[149] To promise an operating surplus in the 2009 Business Plan, and less than twenty pages later begin discussion of the need for a 'revenue guarantee', a mask for illegal operating subsidies,[150] was inexcusable.[151]

6.0 COMPLETE CHSR FUNDING HAS NOT MATERIALIZED, NOR IS LIKELY TO BE FORTHCOMING

In April 2008, Legislators working on AB3034 required an investment grade budget plan from the California High-Speed Rail Authority (CHSRA). In November 2008 the voters of California approved Proposition 1A, which allocated $9.95 billion in State General Obligation (GO) bonds for the proposed $33 billion construction of a high-speed rail system running between Oakland, Sacramento, San Francisco and San Diego.[152] No business plan of any quality was provided by the CHSRA prior to the November 2008 election, despite being required by its authorizing law.[153]

To date, only three publicly available sources describe the finances of the proposed $42.6 billion CHSR system: page 12 of the Authority's 2008 Business Plan, provided after the legislated required date and the November 2008 election; pages 92-108 of the Authority's 2009 Business Plan; and the April 2010 Addendum to the 2009 Plan. For a project of this magnitude, these pages offer little detail on whether the project will meet its financial claims and its legal obligation to require no operating subsidy.[154]

The 2009 Plan projected a $370 million operating surplus the first year the trains run, without providing a detailed financial model to support that claim.[155] Ticket price estimates were not grounded in detailed revenue and operating cost projections. Rather, ticket prices quoted in the Authority's 2008 and 2009 business plans – 55% and 83% of the average airline ticket prices – were selective inputs to the Authority's ridership model. These inputs are unsupported or verified by independent market research as being investment grade data. The CHSRA's assertion that the project meets investment grade standards is without an independent basis of proof. In short, the plans offered by the CHSRA do not qualify as investment grade finance plans.

6.1 CHSRA's Proposed Capital Budget Sources Are Heavily Skewed To 'Free' Government Money

The 2009 CHSRA Business Plan specified four sources of capital prior to the start of operations in 2020:[156]

Federal Grants	$17-19 billion
State Grants (actually Prop. 1A bonds)	$9.95 billion
Local Grants	$4-5 billion
Private Debt or Equity Funding	$10-12 billion

While the CHSRA may count federal and local funds as interest-free non-repayable grants, all monies, including State and possible private investor funds, will cost the taxpayers of California principal and interest. Debt servicing on the $9.95 billion of authorized California state general obligation (GO) bonds at the present California GO bond rates would be over $60 million a month. This cost to the CHSR is nearly double the $370 million of operating surplus claimed by the Authority for its first year of operations (2020).[157]

As of July 2010, the CHSRA had potential access to the $9.0 billion of the $9.95 billion of GO bonds authorized by CA Prop 1A. The Authority also had been granted $2.34 billion from the $8 billion that Congress awarded in FY2010 for intercity passenger rail through the American Recovery and Reinvestment Act (ARRA), widely known as the stimulus funds.[158] The state GO bond funds under AB3034 can only be used to match other non-state funds on a dollar-for-dollar basis. Assuming the entire FY2010 ARRA funds are allocated, the total of funds secured by CHSRA to date, $4.7 billion ($2.34B in federal grant dollars matched by $2.34B of state bonds), represents about 11% of the $42.6B the Authority presently projects as the cost of the first phase of CHSR construction between Los Angeles and San Francisco.[159] This state of funding is much less promising than anyone anticipated in 2008 or 2009.

6.2 Purchasers For The $9.95B Of Guaranteed GO Bonds Have Not Come Forward

The market for the $9.95 billion of CA General Obligation bonds authorized by AB3034/Prop 1A has yet to emerge. Even with the full faith and credit of the State of California, the future of selling these bonds is questionable. In mid-July, State Treasurer Lockyer weighed in on the 'salability' of State GO bonds: *"I would be reticent to try to go to market to issue bonds to finance the state's share. The only discretion I have is to say, You can't sell this. No one will buy this bond, certainly not at any reasonable price."*[160] Investors' reluctance to purchase the state's GO bonds is intimately linked to the risks associated with

California's repeated inability to balance its budget. The Treasurer has been 'testing the waters' and found little receptivity to buying into an indebted State's future. If that is the situation for guaranteed return investments, then what do finance-savvy investors think of buying into the non-guaranteed debt the Authority needs?

6.3 The Probability of CHSRA Receiving The Full Complement Of Federal Grants Is Small

In Fiscal Year (FY) 2010, the Federal ARRA (P.L. 111-5) allocated $8 billion for intercity passenger rail projects, including high-speed rail. Forty-five applications were submitted from 24 states to the Federal Railroad Administration (FRA) requesting a total of approximately $50 billion in FY2010 ARRA funds.[161] California requested $4.7B, nearly 59% of the total federal allocation. The State received $2.34B, about half of its request, but still a hefty 28% of the national total. That grant includes $400 million specifically for the San Francisco Transbay Terminal in addition to CHSR construction, equipment and technology purchases.

The CHSRA assumes it will get $3 billion in additional federal grants each year for the next 5-6 years, for a total of $17–19 billion. Within weeks of the 2010 ARRA allocation, California's Auditor pointed out, "*. . . the Authority's spending plan includes almost $12 billion in federal and state funds through 2013, more than 2.5 times what is now available.*"[162]

The CHSRA might assume that a potential alternative source of Federal grants is the Federal Highway Trust Fund, a pool of $27B provided to the states. If the CA State Legislature authorized it, some or all of the state's highway funds could be used for intercity rail.[163] But, as a Congressional Research Service report notes, "*. . . the dedicated funding source for federal highway and transit programs—the Highway Trust Fund—is unable to sustain even the current level of program funding, and had to be supplemented by $8 billion in General Fund appropriations in FY2008 and another $7 billion in FY2009.*"[164] That does not seem like a likely source of future funds.

6.3.1 The FY2011 Federal budget is constrained by an unsustainable fiscal deficit and neither Congress nor the Administration seem ready to again generously fund the national high-speed rail program.

The Federal deficit for FY2010 is estimated to be $1.3 trillion. The Congressional Budget Office estimates that $9.7 trillion will be added to that over the next decade, raising Federal debt to above 80% of the nation's Gross Domestic Product.[165] It seems unlikely the Federal government will be searching for expensive

new infrastructure projects in the foreseeable future, a situation that questions the continued financial viability of the CHSR.

On July 1, 2010 the House Appropriations Subcommittee earmarked $1.4B for high-speed rail in FY2011.[166,167] On July 22 the Senate Appropriations Committee and the Administration's Office of Management and Budget (OMB) requested $1B for high-speed rail and intercity passenger rail development, a drastic reduction from the initial $8B in FY2010.[168] These requests need to be reconciled, and will surely not increase. In FY2010 the state governments could also use $1.5 billion of ARRA discretionary grants for projects *"that will have a significant impact on the Nation, a metropolitan area, or a region."*[169] However, those discretionary grants are not in the FY2011 budget. A good 'guestimate' of the outcome of reconciled requests would put the total national high-speed rail program's funds for FY2011 at about $1.2 billion.

In August, CHSRA applied for some of the roughly $2 billion of intercity rail funds that the FRA did not spend in FY2010 (which ended on September 30, 2010). It 'won' $194 million, about 9% of that 'Fiscal Christmas' FY2010 monies, not the 28% of the FY2010 national intercity rail grants it won in April.[170] Matching the April $2.35 billion award and $194 million Fiscal Christmas grant with equal GO bonds from Prop 1A; as of October 2010, the CHSRA has slightly over $5 billion to spend on an estimated $42.6 billon project. That's about 12% of what is probably an underestimated Phase I capital cost.

Congress and the White House seem reluctant to continue a now-criticized high-speed rail program.[171] With the CHSR project competing with many other intercity rail projects and a national trend towards fiscal reduction, it seems unlikely the CHSRA will receive anything near the full $17-19 billion in federal grants projected in their 2009 Plan.

6.4 CHSRA's Assumptions About Local Government Contributions Have No Historical Basis

In addition to the 'free-to-CHSRA' Federal grants and the State's ability to match those equally with GO bonds, the CHSRA assumes that the cities and counties of California will provide $4-5 billion of interest-free grants.[172] However, this is a time of severe fiscal constraint at all levels of government, and the Authority does not address several critical questions about this assumed source of funds:

- How are financially strapped local governments going to produce these anticipated monies?
- How willing will California's local governments be to put the

CHSR project's needs ahead of their own local needs?
- Why should city and county governments give the CHSR project interest-free grants, when the municipalities and counties themselves must borrow at market rates?

Suggestions have been made that local communities will be able to join public-private property development partnerships and reap income from building at or near CHSR stations. However, the statewide CHSR project is limited to twenty-four such stations, including in less populated portions of the CHSR's route. Even if the cities' average revenue per station from such projects were an unlikely $100 million, the aggregate would be only half of that assumed by the CHSRA's funding plan ($2.4B vs. $4-5B).[173] The assumption that local governments' grant contributions can be made through co-participation in development projects is both vague and unrealistic.

No precedent exists for local government funding of inter-city transport or other infrastructure projects that are not under their direct control. Local governments look to overlying jurisdictions to plan, build and operate transit projects that cross their borders. There is no record of such a claim being made on local governments in any past transport project, and the CHSRA should certainly have known that during their financial planning. The logic behind the CHSRA's assumptions about local government financial contributions to HSR construction remains a mystery.

6.5 Twenty-Three Months after Proposition 1A, There Is No Private Equity Or Debt-Based Financing For The CHSR

The CHSRA assumed that private lenders would come forward with $10-12 billion, about one-fourth of their estimated total Phase I CHSR capital cost. The 2009 Plan asserted the need to provide investors with a 16% after-tax internal rate of return, roughly equal to a pre-tax return of 21%.[174] This is an attractive return, but only if the risk-reward ratio is moderate.

By mid-July 2010, the State Treasurer was doubtful whether the private sector would come forward to provide the $10-12 billion to construct the project. Treasurer Lockyer commented "*. . . they're convinced that no one can finance the routes from L.A. to the Bay Area, that it just will never work economically, certainly in the foreseeable future. . . . So there's financing potentially available if it's a good deal. I'm just not yet convinced the investors are going to think that's a smart investment to make.*"[175]

As of early fourth quarter-2010 it is not known whether any private equity or fixed income lender has done due diligence on the CHSRA financial plan. But it is clear that no private lender has yet been willing to commit to what is represented as an attractive return. The closing of the much-touted Shanghai-to-Nanjing high-speed rail, losses by Taiwan's high-speed rail, and the bankruptcy of the Las Vegas monorail might have dampened whatever initial enthusiasm there may have been from private capital sources.[176] Twenty-three months after Proposition 1A passed, the lack of any commitment of private equity or risk-based debt financing raises doubts about the private sector's view of earning any return on risk-based lending for California's proposed high-speed rail project.

6.6 At Present California Is In The Least Favorable Position Possible To Go To Debt Markets To Fund The CHSR Project.

Even if the Great Recession had not happened and the Federal Government was not purposely and rapidly increasing its debt through fiscal stimulus, the State's profligate spending even in 'good times' has put it at a disadvantage relative to other borrowers. Add to that the new dimensions of increased scrutiny by the State Treasurer and the SEC, and California will be hard pressed to attract bond buyers.

6.6.1 While today's municipal bond market is relatively benign, inflation and the Federal deficit are likely to change that.

California depends on the 'kindness of strangers' every time it goes to the bond market to fund operations (with short-term revenue-anticipation bonds) or infrastructure projects, such as CHSR, (with long-term GO bonds). The current demand for bonds is relatively healthy, making the interest income return, or 'carry', on municipal bonds relatively low. However, recent trends indicate dramatic changes for the State's ability to secure debt financing.

Many economists and investment advisors believe that historically low interest rates (driven by nearly zero inflation) will rise in the intermediate term. Gold's recent meteoric rise is a sign that the markets see higher inflation coming.[177] Once interest rates are expected to go up, the value of existing bonds go down; which increases the perceived risk of buying bonds today. [178]

The large Federal government deficit, funded through the bond market for US Treasury securities, is likely to continue for at least several more years. If the current high demand for GO

bonds lessens, then the current, record-high US Treasury bond sales will likely 'crowd out' borrowers like the State of California which have lower credit ratings and higher perceived risk.

6.6.2 California's ability to raise Prop 1A-Authorized GO Bonds is and will be seriously challenged.

California's structural budget deficit and faltering economy have driven the State's credit rating, presently at A- (with a negative outlook) by Standard and Poors, to be the lowest credit rating among the 50 states.[179] It's like a family that has 'maxed out' on its credit cards. The more debt that California carries, the greater the downward pressure on the State's credit rating and therefore the greater 'spread' between what California and the US government must pay to attract investors. And the more debt the State has, the higher the interest rate the State must offer on its GO bonds. California's current debt load stands about $68 billion. Prop 1A's $9.95 billion of GO bond funding, plus the $4-5 billion from local governments, plus any of the $10-12 billion that might come by private financing would add materially to the debt burden, making the deficit that much harder to close and risking further damage to the State's already low credit rating.

These very real and large financial risks faced by California are starting to be noticed by investment advisors, who could start to steer their clients away from supplying California with needed debt capital. In September financial analyst Meredith Whitney reported that the states represent the new systemic risk, paralleling the role she first warned of that banks played in the 2008 financial crisis. California was the worst credit risk Whitney's firm found.[180]

6.6.3 More rigorous Securities Exchange Commission (SEC) oversight and the CHSR project's risks will exacerbate California's weakness in the bond markets.

The 'wild card' in state's debt, unfunded pension liabilities, is getting increased attention.[181] New and vigorous SEC oversight raises the bar on how transparent California and other states will need to be in future debt offerings. The SEC and the State of New Jersey recently settled federal civil fraud charges of failing to inform bond investors that it had not met obligations to its pension plans. The chief of the SEC's municipal securities and public pensions unit said, *"We want to make sure that states and municipalities are adequately disclosing"* their pension fund liabilities.[182]

The future environment for debt financing for California will be more demanding. California's political leaders need to make

choices about what is deserving of being funded by the State's taxpayers and what its citizens cannot afford. As presently structured, the financial plans of the CHSR project are sufficiently questionable to ask whether California can absorb their unknown risks on ridership, capital and operating expenses.

6.7 Discussions With Sovereign Governments Or Others About Using 'Creative Financing' To Fund CHSR May Not Be In The Best Interests Of California

6.7.1 How CHSR gets financed matters a great deal.

Over the past two decades global financial firms and sovereign nations have developed a variety of sophisticated financing techniques. Many such financing techniques included instruments whose value was questionable or not easily ascertained, were not exchanged or recorded in an open market, or were not secured by Tier-I assets. Moreover, widespread use of this kind of 'creative financing' led to overleveraged institutions, overleveraged housing, and an overleveraged economy that was not resilient in the face of unexpected stress. [183]

This level of financial engineering helped bring the global economic system to near financial Armageddon in the latter part of 2008 and brought on the Great Recession, with which the world is still coping. California has shown concern, and the State's Treasurer has asked major finance houses to report on whether their use of such financial engineering is undermining the State's financial standing.[184] Clearly, how our institutions are financed matters a great deal!

6.7.2 The CHSRA's current business plan requires $10-12 billion in private financing.

As described earlier in this Review, the CHSRA plans to raise $10-12 billion in some combination of private debt and equity financing. The choice of debt versus equity will be critical in this 'final' tranche of funding for CHSR. On the one hand, debt must be serviced with regular interest payments and principal repayments, which will put a negative cash flow load on the operations of CHSR. On the other hand, equity is a relatively permanent form of financing that does not generally require consistent or periodic servicing. Most probably, one of the sales pitches that the CHSRA is making to prospective debt or equity investors is that California is going to provide, via a proposed general-obligation bond offering, a $9.95 billion financing tranche, the Federal Government a $17-19 billion tranche, and California cities and counties a $4-5 billion tranche; the latter two in repayment-free grants. In total, this provides a potential 'free gift' of $32-33 billion to the Authority to underpin any

investment by private investors, giving investors a higher probability of achieving a return on their investment. This is the 'investment subsidy' to which California voters and legislators *implicitly* agreed in return for getting an *explicit* agreement that there would be no operating subsidy (i.e., AB3034).

6.7.3 Additional private debt or equity financing beyond the contemplated $10-12 billion may be sought by the CHSRA.

Several nations have established offices in Sacramento to sell high-speed rail equipment, technology, services or operations skills to the proposed project.[185] Some have the expertise and lengthy records of building and running state-owned high-speed rail systems. Their objectives are to sell equipment and services at a profit, generate jobs in their home countries, and mitigate risks to their private or government-backed companies. If backed by one or more national treasuries, these companies or state entities can become formidable resources to configure financial deals to assist in securing equipment or services contracts.

In April 2010 Assembly Member Galgiani (District 17) told the Assembly Budget Subcommittee that the Chinese were willing to finance forty percent of the CHSR project.[186] In September Japan's Transport Minister, Seijii Maehara, said the Japan Bank for International Cooperation was prepared to lend funds to make the project happen and a few days later China's national railway ministry offered a "complete package" to build the CHSR system – both offers the result of Governor Schwarzenegger and the Authority's promotional tour.[187] What terms, conditions and stipulations there were to such financing offers are unknown.[188] While it is troubling that we know little or nothing of their substance, we can only assume such conversations addressed how to implement the CHSRA's plans and, at the same time, both mitigate risk for the foreign financiers and generate profitable business for the foreign companies or entities. What is not clear at this juncture is whether any deals under discussion are in the best financial interests of citizens of the State of California.

There are indications in the press, and by the Authority's four applications in August to the FRA to fund only one segment, that the CHSRA has concluded that it is unlikely that they will be able to raise the federal ($17-19 billion) and local ($4-5 billion) government tranches of the planned grant monies and are now turning to foreign governments to make up for the potential shortfalls. Unless such funds were to come in the form of equity – a highly unlikely scenario – the CHSR project would become

more financially leveraged with debt and saddled with unplanned debt service payments, further raising the risk of an already highly risky project.

6.7.4 CHSR will become an even riskier project should the CHSRA leverage the project beyond the current financing plan.

If the CHSR were to actually generate an operating surplus, as optimistically projected in the 2009 Business Plan, then the CHSR might be an acceptable investment for the operator.[189] But, as already shown in this Review, an operating surplus – even with the entire amount of the planned $22-23 billion of repayment-free grants from the federal and California city/county governments – is extremely speculative. Without the full complement of such grants, which are highly unlikely to be secured by the CHSRA, the CHSR may be saddled with additional debt service payments and become even less likely to achieve the legal requirement to financially breakeven. Several questions must be answered to protect the 'no operating subsidy' provision of AB3034 and, therefore, California's fiscal health:

1. Will lenders to CHSR – or equity shareholders that may arise – require a revenue guarantee from the State of California, a subsidy, or any other forms of risk-reduced finance techniques?
2. What happens if Phase I of the system does not produce an operating surplus as claimed?
3. Is the State of California prepared to make up the difference between revenues and expenses; and if so how?
4. If the operator is a private company – or a quasi-private company with sovereign government participation – who owns the assets of the system if there is an ongoing operating deficit, as seems likely; i.e., the system goes bankrupt?
5. Will any of these lenders or shareholders require any form of *quid pro quo* on the exclusive use of their or their nation's technology?
6. Does the State of California, possibly the 'last-resort' owner-operator of the system and possibly a source of (illegal) operating subsidies in the case of a CHSR bankruptcy, become 'locked in' to the former operator's technologies?

6.8 The CHSR Project's Financial Risk Might Be Borne By Californians

The risk of a scenario in which Phase I of the CHSR system doesn't break even financially, and where the private or public sources of financing are protected – and possibly equipped with an advantageous position vis-a-vis their technology in return for their financial support – may be acceptable to the CHSRA in

order to achieve its 'get-it-built-and-they-will-come' agenda. Such added risk to the CHSR project should not be acceptable to the State of California and its taxpayers, particularly in light of the 'no-operating-subsidy' provision of AB3034. We are concerned that the probable lack of Federal and local government funding in the amounts projected, and the continued hesitation of arms-length debt and equity investors, make a 'creative financing' package attractive to the CHSRA to further its agenda. As part of a 'game of nations,' such a scenario is not out of the question, but should be firmly resisted by the Legislature and the citizens of California since the financial risks and attendant subsidies will most likely end up being borne by them in the case of the financial failure of CHSR.

7.0 CHSRA'S JOB CREATION FORECASTS ARE TOO VAGUE AND TOO LARGE TO BE CREDIBLE

Job creation estimates, as cited most recently by the CHSRA, would be enormous if the claims could be backed by more data or more transparent data.

7.1 CHSRA Is Silent On Exactly When Or Where Jobs Occur, Or How Many FTE Jobs Each Year Their Forecasts Represent

We have no underlying analyses by CHSRA to determine the veracity of their claims. The scarcity of CHSRA data or underlying calculations and assumptions undermines the CHSRA's employment assertions. Such large promises of construction and permanent employment should be accompanied with information about whether these are Full Time Equivalents (FTE's); what the average income per job would be; what years these jobs would be created, and how long – if not forever – would these permanent jobs last.

During the Prop 1A campaign, proponents officially committed that *"These are American jobs that cannot be outsourced"*.[190] Yet since then the Authority is silent about where – whether in California, elsewhere in the US, France, China, or Germany or another country – these jobs will be created. Very few of the highly-skilled operations-relative jobs could be taken by Californians today. The state simply doesn't have the history in high-speed rail to produce those job skills. We also know that once those jobs are taken, they are likely to be held on to by union members, and as in the case of Amtrak, difficult to change over to others who may be Californians. Even sourcing materials will be difficult, since today the developing nations' rapid growth absorbs a large amount of the world's steel. This problem is exemplified by the long wait for specialty steel from China for the SF-Oakland Bay Bridge. CHSRA doesn't address those questions of job location.

7.2 CHSRA's Forecasted Employment For The 8-10 Years Of Construction Is Seriously At Odds With Estimates Based On Bureau Of Labor Statistics Data

Without access as to how CHSRA calculated its forecasted employment figures, we are forced to use the 2009 Plan forecast, *"In California, the initial system is projected to create the equivalent of 600,000 full-time, one-year jobs over the course of its construction"* at face value.[191]

This forecast differs from one year earlier, when the Authority predicted 160,000 construction-related and 320,000 permanent jobs.[192] If it had been totally built in just one year, in 2006, at the peak of the state's building boom, the CHSR would have absorbed over half of the 966,300 construction workers then employed. If all the jobs were to occur in a single year, the 600,000 CHSR construction jobs would exceed California's presently employed construction workforce of 556,100.[193]

However, both the earlier 160,000 and the 600,000 (3.75 times larger) 2009 forecasts differ significantly from those using Bureau of Labor Statistics (BLS) data. BLS data show that every $1 million invested creates three construction jobs. CARRD used that baseline and deducted for the costs of rail train sets and equipment manufactured outside California. CARRD said, "*The $25 billion ($42.6 billion less non-California related expenditures) will generate the equivalent of 75,000 years worth of employment using the 3 jobs/$1 million ratio. Over the 10 years that planning and construction are expected to last, this would mean about 7,500 more Californians at work each year. In addition, some of the raw materials used in construction might be produced in California. The total number of construction-related jobs could be 100,000-120,000 one-year jobs, equivalent to 10-12,000 jobs that last the 10 years that construction is expected to last.*"[194] This is certainly not the 600,000 full time one-year jobs CHSRA implies for California's hard-hit construction workers.

Who to believe? CHSRA's forecasts use 20,000 jobs per $1 billion spent on construction.[195] The Bureau of Labor Statistics uses a ratio of three construction jobs per $1 million, which is equal to 3,000 annual jobs created per $1 billion spent. The difference of 17,000 jobs per year per $1 billion spent on construction is not trivial. Since CHSRA doesn't use a BLS-based ratio, and we have no access to how CHSRA arrived at ratio more than six times that of BLS, this key aspect of the construction job-creating possibilities of CHSR must be better understood before proceeding with the project.

7.3 If 'Permanent Jobs' In CHSRA's Lexicon Means Both CHSR Employees, As Well As Those Employed Permanently Because CHSR Exists, Their Forecast Is Beyond Believable.

In August 2010, there were 15,968,000 jobs in California.[196] The CHSRA promises to create 450,000 permanent jobs in Phase I of CHSR, the Los Angeles to San Francisco Transbay Terminal.

If they were all employed in a single year or, if the CHSRA

means that such jobs are actually there permanently – in theory forever – this would represent almost 3 percent of the state's workforce.[197] It is terribly difficult to understand the basis for claiming that a train that speeds between metropolitan areas with so few stops can create so many jobs.

Looked at another way, the Authority's permanent employment forecast is nearly twice the number of total active State of California employees – which stood at 239,586 in May 2010.[198] It is hard to believe the CHSR will create 3% of California's workforce or twice the number of State of California employees.

7.4 If 'Permanent Jobs' In CHSRA's Lexicon Means Only CHSR's Employees, Then Few Jobs Will Be Created

If we assume that CHSRA only meant 'permanent' to mean jobs created for the CHSR's operations during the first twenty years of its operations – 2020 to 2040 – then dividing the 450,000 assertion by twenty years suggests about 23,000 permanent jobs. Consequently the impact of such permanent job creation is minor – something between one-tenth of one percent and one-twentieth of a percent of California's employment. If CHSRA means 'permanent' to be jobs created over a 40-year life of the project, the impact – 0.1% – is miniscule.

If these 23,000 permanent jobs are the real facts of CHSR permanent employment, then CHSR will create only about as many jobs as presently at Google Corporation. And on the basis of jobs created per dollar of investment, CHSR doesn't look like a winning proposition for the allocation of capital resources. [199]

7.5 There Are Inconsistencies In CHSRA's Forecasts That Raise Questions About The Rigor Of Their Methodologies For Computing Employment

CHSRA appears to be confused about its CHSR Phase I employment forecasts. On one page of its 2009 Plan, CHSRA claims that the (presumed) 23,000 permanent CHSR employees will, in 2009 dollars, earn an average of $93,600 including benefits. On the following page of their Plan, a Table shows maintenance costs in 2009 dollars, to be $1.071 billion; of which $634.6 million is labor costs. Dividing labor costs by average benefited compensation per employee lowers the total number of 2035 employees to 6,800 – not 23,000. Again, this assumes CHSRA is speaking of permanent employees being their employees.[200] Once again we are left wondering what does CHSRA mean by permanent jobs.

CHSRA also does not discuss the offsetting losses of jobs in the

airlines and auto-related industries with the creation of their high-speed train. If the CHSR replaces other modes of travel – which it proposes to do – and is not creating net new jobs, but rather replacing one form of transportation services for another, what is the net effect on employment? Even if the new CHSR services are 'better, faster, cheaper and safer', there will be job loses in one or more transport industries for gains in another. It could be a 'net wash' of no new job gains. Or the outcome might be a net loss of jobs, if the new services are more efficient than the old ones. The results are truly unknown and to assert such high gains of jobs created by the high-speed rail system is speculative.

REFERENCES

[1] For purposes of this document, we are using only CHSRA's estimated Phase I capital cost of $42.6 billion. However, this number fails to include several items, not the least of which right-of-way acquisition costs, including eminent domain takings.
[2] AB3034, Chapter 267, as approved by the Governor on August 26, 2008 and filed with the Secretary of State that same day says in Chapter 20 *"(J) The planned passenger service by the authority in the corridor or usable segment thereof will not require a local, state, or federal operating subsidy."*
[3] Ibid
[4] See: Minimum Revenue Guarantee; a memorandum to Curt Pringle, Medhi Morshed, Jeff Barker, CA High-Speed Rail Authority; from Sasha Page and Alene Tchourmoff; Infrastructure Management Group Inc; dated February 21, 2010. Among other approaches the memorandum suggests that the operator *"could be eligible to have part of its capital costs defrayed**. This type of capital cost-only limitation has been employed both in federal and state highway and transit projects and cannot in any sense be considered an "operating subsidy**." Unlike transit that often requires long-term guarantees, the revenue guarantee would be designed to be **limited in duration (5-10 years)** . ."* (emphasis in the original)
[5] Elaine M. Howle and Doug Cordiner, Chief Deputy State Auditor; California State Auditor Bureau of State Audits; Report 2009-106; April 29, 2010. Public Letter
[6] The CHSRA continues to list both State of California monies and local government monies as non-repayable grants. However, the State of California (and its taxpayers) will be responsible for repaying those monies with interest; a reality not reflected in the Authority's funding map. See: California High-Speed Rail Authority (HSRA): Report to the Legislature; December 2009; page 108
[7] San Diego Union-Tribune; Sign-on; July 14, 2010
http://www.signonsandiego.com/news/2010/jul/14/u-t-editorial-lockyers-straight-talk/
[8] Op.cit The Official Voter Information Guide says *"Proposition 1A is a $9.95 billion bond measure for an 800-mile High-Speed Train network that will relieve 70 million passenger trips a year that now clog California's highways and airports WITHOUT RAISING TAXES. . . Proposition 1A will protect taxpayer interests."* (emphasis in original): See http://www.voterguide.sos.ca.gov/past/2008/general/argu-rebut/argu-rebutt1a.htm
[9] Op. cit California High-Speed Train, Business Plan, November, 2008; pg.1
[10] Ibid; pg.2
[11] Only $9 billion of AB3034's $9.95 billion of Government Obligation bond enabling legislation will go to high-speed rail. Another $950 million was allocated for transport projects with 'independent utility'. While not directly part of the CHSR, the State must also service debt from bonds sold for that purpose. Therefore, debt servicing is on $9.95 billion.
[12] Legislative Analyst's Office; Analysis of the 2008-09 Budget Bill: Transportation High–Speed Rail Authority (2665) *"The bond measure was initially scheduled to be placed on the November 2004 ballot, however, the measure was postponed twice and is now scheduled for the November 2008 ballot."*
http://www.lao.ca.gov/analysis_2008/transportation/trans_anl08006.aspx
[13] See: Ballotpedia:
http://ballotpedia.org/wiki/index.php/California_Proposition_1A_%282008%29
[14] On August 6, 2010 the Authority submitted four applications to the FRA for funding one or more of the four segments: Merced to Fresno: Fresno to Bakersfield; Los Angeles to Anaheim or San Francisco to San Jose. *"The Authority submitted four separate applications for this current round of funding – one for each section – because it has not yet been determined where that Recovery Act funding will be put to use."* See: California Seeks to Bring Additional Federal Funds to State's High-Speed and Intercity Rail System; a Press Release:
http://cahighspeedrail.ca.gov/hs_intercity_passrailapps.aspx
[15] Part of AB3034 (Prop 1A) refers directly to California's Streets and Highways Code; Section 2704.04 (F) which Phase I of the CHSR to begin work in the segment whose capital costs are the least of all segments. This suggests the Authority must give

priority to and should be assembling funds to begin Phase I somewhere outside of the state's two major metropolitan areas. This provision was also cited in the official ballot description. See: Op.Cit. The Official Voter Information Guide says *"Proposition 1A will protect taxpayer interests.*

- *Public oversight and **detailed independent review** of financing plans.*
- *Matching private and federal funding to be identified BEFORE state bond funds are spent.*
- *90% of the bond funds to be spent on system construction, not more studies, plans, and engineering activities.*
- *Bond financing to be available to every part of the state.*
- ***The most cost-efficient construction segments to have the highest priority."*** (emphasis added)

To date no independent peer review has been done, and the CHSRA has been accused of leaving out cost items (e.g. eminent domain, land acquisition) in certain segments to increase their likelihood of being built.

[16] Op. cit. AB3034, Chapter 267, Chapter 20, *(J)*

[17] Among transportation experts who have no financial or vested interest in the outcome of the proposed California high-speed rail system, and have questioned the wisdom or financial feasibility of the national or California high-speed rail systems are: Cox, Wendell; Glaeser, Edward; Julian, Liam; Levinson, David; Love, Jean; Moore, Stephen; Moore, Adrian; Orski, Ken; O'Toole, Randal; Pickrell, Don; Poole, Robert and Vranich, Joseph.

[18] Bay Area Rapid Transit's (BART) experience with the San Francisco airport extension is telling. The BART 1996 EIR developed by Parsons-Brinckerhoff (the CHSRA's Project Management Team) projected initial daily ridership of 39,500 – and daily ridership of 68,600 by 2010. When the airport extension opened in 2003, daily ridership averaged 16,600 or 42% of projections. July 2007 data indicated ridership leveled off at 17,452, only 25% of the EIR projection for 2010. In January 2008 BART discontinued service between Millbrae and the airport due to low ridership. Not surprisingly BART's June 2008 data said SF-SFO ridership had decreased to 10,700, less than a fifth of what it was supposed to be. In more than seven years of its existence, the SF-SFO link has cost the agency $73 million. That doesn't help offset BART's $7.5 billion maintenance shortfall. Phase I of the CHSR plans include a Millbrae stop as an airport link, which will indubitably 'cannibalize' BART and Caltrain riders, although it may save less than two minutes travel time from the downtown to the airport. See: http://www.sfexaminer.com/local/BARTs-price-of-expansion-98637079.html#ixzz0ytA2t9EL

[19] Status Report on California's Bond Debt: Assembly Budget Hearing; December14, 2009. Bill Lockyer, State Treasurer: page 4. True interest cost of California's General Obligation Bonds in December 2009 was 5.93%. At that interest rate, California pays a premium credit spread to US Treasuries of 310 basis points – a higher spread than Mexico, Brazil, the Philippines or Indonesia.

[20] 2008 California High-Speed Train BUSINESS PLAN November; pg. 12

[21] Op.cit. HSRA Report; December 2009; pg. 81.

[22] Source: (http://www.treasurer.ca.gov/bonds/debt/201008/authorized.pdf) .

[23] One notable change was that the initial ridership model had more people boarding the train daily in Gilroy than board Amtrak's Acela every day in Boston.

[24] A recent analysis of the ratio of fares to operating costs for twenty-seven US transit agencies found that Austin's system provided only 9%, while Washington's WMATA recovered nearly 62% of its operating costs from the fare box. Los Angeles's LACMTA recovered only 30% while San Francisco's BART recovered 45% and Caltrain 41% of their operating costs from tickets, See:
http://www.ntdprogram.gov/ntdprogram/data.htm
http://www.ntdprogram.gov/ntdprogram/data.htm
http://en.wikipedia.org/wiki/Farebox_recovery_ratio

[25] For reference, this potential HSR Operating Deficit of $656 million is roughly equivalent to a third of the annual K-12 expenditure in the California State budget. We are not saying that K-12 education would be cut to pay for CHSR's deficit, but something would need to be cut and this is not a trivial sum.

[26] Op.cit. The Official Voter Information Guide says *"Routes linking downtown stations in SAN DIEGO, LOS ANGELES, FRESNO, SAN JOSE, SAN FRANCISCO, and SACRAMENTO, with stops in communities in between."* Yet Phase I is only for funding the LA/Anaheim to the San Francisco Transbay Terminal.
[27] Op.cit. The Official Voter Information Guide says *"Routes linking downtown stations in SAN DIEGO, LOS ANGELES, FRESNO, SAN JOSE, SAN FRANCISCO, and SACRAMENTO, with stops in communities in between."* Yet Phase I is only for funding the LA/Anaheim to the San Francisco Transbay Terminal.
[28] California High-Speed Train, Business Plan, November, 2008; pgs. 7-9
[29] The Official Voter Information Guide of the Tuesday, November 4, 2008 California General Election says: *"Proposition 1A will save time and money. Travel from Los Angeles to San Francisco in about 2 hours for about $50 a person."* See http://www.voterguide.sos.ca.gov/past/2008/general/argu-rebut/argu-rebutt1a.htm
[30] California has what is popularly called a 'bait and switch law' in the Business and Professions Code, Section 17500–1709. In 2009 Attorney General Edmund G. Brown sued Midas on misrepresentation of final prices for its services. See: http://www.consumeraffairs.com/news04/2009/06/ca_midas.html. In 2010 Attorney General Brown sued on the issue of false presentations in home re-financing. See: http://livinglies.wordpress.com/2010/06/11/calif-atty-general-brown-goes-after-bait-and-switch-refi-fraudsters/
[31] See: Report of Responses to the Request for Expressions of Interest For Private Participation in the Development of A High-Speed Train System in California by the Infrastructure Management Group (IMG) to the California High-Speed Rail Authority Board Financing Workshop, dated October 2008; page 2 of 17 The presentation was given in June but the printed report issued in October. *"A presentation summarizing the results of the RFEI was made before the Authority Board of Directors on June 11, 2008* "
[32] HSRA Report To The Legislature; December 2009; pg. 104 "*Their responses supported the Financial Plan's assumption of private sector interest in a P3 arrangement for the high-speed train project."*
[33] Op.cit IMG October 2008 Workshop; figure on page 11 of 17
[34] In the 2008 CHSRA Business Plan, the funding sources for the ten-$3.6 billion capital project included $6.5-$7.5 billion of Public Private Partnerships (P3). See Figure 26, page 25
[35] HSRA Report To The Legislature; December 2009; pg. 104
[36] In August 2008, the Legislature demanded a business plan by September 1st and said " *This bill would require the authority to revise its business plan by September 1, 2008, as specified, and to submit the revised plan to the Legislature."* See: AB3034 Chapter 267, as approved by the Governor on August 26, 2008 and filed with the Secretary of State. The Legislative Analyst's Office (LAO), page TR-46."*In June 2008, an oversight report by the Senate Transportation and Housing Committee recommended that the business plan be similar to a financial prospectus prepared for investors in new stock or bond offerings and not an advocacy document."*
[37] Cover page; California High-Speed Train, Business Plan, November 2008.
[38] Ibid pgs. 17-22. Three succeeding pages list out risks to the project but without a plan to manage those.
[39] Op. cit AB3034, Chapter 267*:" Section 185033 is added to the Public Utilities Code, to read: 185033. The authority shall prepare, publish, and submit to the Legislature, not later than September 1, 2008, a revised business plan . . "AB3034's description of reporting requirements for the Authority further states "(d) Prior to committing any proceeds of bonds described in paragraph (1) of subdivision (b) of Section 2704.04 for expenditure for construction . . . (E) an assessment of risk and the risk mitigation strategies proposed to be employed."* (emphasis added)
[40] The Official Voter Information Guide of the Tuesday, November 4, 2008 California General Election says: *"REBUTTAL TO ARGUMENT AGAINST PROPOSITION 1A California's high-speed rail network requires NO TAX INCREASE and is subject to strict fiscal controls and oversight. It's simple and fair once completed, THE USERS OF THE SYSTEM PAY FOR THE SYSTEM. That's why taxpayer watchdog groups support Proposition 1A."* (emphasis in original): See http://www.voterguide.sos.ca.gov/past/2008/general/argu-rebut/argu-rebutt1a.htm

[41] CHSR 2008 Business Plan, Figure 26, page 21 shows that of the $33 billion estimated capital costs, the Authority expected $6.5-7.5 billion to come from Public Private Partnerships (P3)

[42] Op. cit Presentation by IMG to CHSRA Financing Workshop; page 3 of 17. There were only three operators among the five claimed by IMG: SNCF, the French national railways operator; Stagecoach, a UK transport group operating busses and trains; and Veolia, a private German operator of busses and trains. ACD ID, listed as an operator is a collision avoidance supplier; and Angel Trains is a UK rolling stock leasing company. Neither operate rail systems according to their web descriptions.

[43] Joint Legislative Informational Hearing; California High-Sped Rail Authority's 2009 Business Plan; January 19. 2010; pg. 10

[44] Legislative Analyst's Office; The 2009 High-Speed Rail Business Plan; Presented to: Assembly Transportation Committee Hon. Mike Eng, Chair, January 11, 2010, pages 1-9. Among these deficiencies were: **–** **"***Information provided in the plan was very general and did not provide specifics that are included in typical business plans."*; **"***The plan's discussion of risk management is significantly inadequate . . "* **"***Few deliverables or milestones are identified in the plan against which progress can be measured."*; **"***The plan contains no discussion of the authority's plans or processes to (1) identify potential threats or (2) manage, respond, and mitigate those threats";* **"***The plan does not provide any numerical ranges nor confidence intervals for projections contained in the plan (such as cost, revenues, or ridership)."*; *"The plan contains no detailed discussions or consideration of even the most significant risks to the project, such as ridership and funding.;"The plan addresses the risk of incorrectly forecasted ridership with one sentence, . . "*; *"To avoid the risk of failing to win credit approval from investors, the authority's strategy is "to clearly communicate the project and obtain up-to-date feed- back."*; *"To mitigate the risk that financial markets shut down and stop lending, the authority "has to continually monitor the market and develop strong back-up strategies such as project segmentation."* ; *"The authority plans to avoid the risk that governments are not able to follow through on their commitments "by carefully assessing how each government funding source affects the build-out of each segment."; "The program management and project delivery timelines contained in the plan are very general and provide little opportunity for increased accountability. . . few deliverables or milestones included against which progress can be measured."; "Because the timelines in the plan are so general, it is unclear in what order various events will occur."; "The plan assumes some form of revenue guarantee from the public sector to attract private investment. . . The plan does not explain how the guarantee could be structured so as not to violate the law."; "If the public sector pays for insurance, that would constitute an operating subsidy in violation of Proposition 1A*."; *"The plan assumes between $17 billion and $19 billion from federal funds by 2016, or nearly $3 billion per year for the next six years. In comparison, over the past five years California has received roughly $3 billion per year of formula funding for the state's entire highway system . . "*

[45] ADDENDUM to the California High-Speed Rail Authority's "Report to the Legislature; December 2009; Approved by High-Speed Rail Authority Board April 8, 2010; Submitted April 13, 2010.

[46] Elaine M. Howle and Doug Cordiner, Chief Deputy State Auditor; California State Auditor Bureau of State Audits; Report 2009-106; April 29, 2010. Public Letter.

[47] See: California High-Speed Rail Authority Board Financing Workshop; A presentation by Infrastructure Management Group Inc. and Goldman Sachs; September 3, 2009; pages 9-13

[48] ibid. pg. 42.

[49] Source: Assembly Bill 3034, California Legislature, 2007-08 Regular Session, pg. 4; SECTION 1 Section 185033 of the Public Utilities Code; lines 14-19.

[50] The auditors were quoted as saying the risk management plan was *"generic, incomplete and likely out of date."* (KPMG Final report, pg. 36-37.

[51] Committee Report: Oversight Hearings of the California High-Speed Rail Authority; Prepared by the Senate Committee on Transportation & Housing: June 2008; pg.5

[52] Legislative Analyst's Office: The 2009 High-Speed Rail Business Plan; January 11, 2010;pg. 4.

[53] ibid. pg.4. *nota bene*. As yet the combined State GO bond authority and the allocated (not appropriated) Federal grants do not equal the monies needed to construct the four, independent rail segments the Authority proposes to start with. The mandate that the Authority must prove financing is secured for those four segments seems to contradict the Authority's statement of how *"a funding source affects the build-out of each segment"*
[54] Addendum to the California High-Speed Rail Authority's "Report to the Legislature; December 2009; Approved by High-Speed Rail Authority Board: April 8, 2010; Submitted April 13, 2010; pg. 33.
[55] ibid. pg. 34.
[56] ibid. pg. 34.
[57] ibid. pg. 33.
[58] Op. cit; Addendum, pg. 37.
[59] See: AB3034 Chapter 267, as approved by the Governor on August 26, 2008 and filed with the Secretary of State. *"The bill would also require the authority to establish an independent peer review group for the purpose of reviewing the planning, engineering, financing, and other elements of the authority's plans and issuing an analysis of appropriateness and accuracy of the authority's assumptions and an analysis of the viability of the authority's funding plan for each corridor."*
[60] See: AB3034; noting the addition to the Public Utilities Code SEC. 2. Section 185035, paragraphs (b) (3)" *One representative from a financial services or financial consulting firm who shall not have been a contractor or subcontractor of the authority for the previous three years, designated by the Director of Finance."* (c) (d) and (e) *"The peer review group shall report its findings and conclusions to the Legislature no later than 60 days after receiving the plans."*
[61] http://www.cahighspeedrail.ca.gov/faqs/planning.htm
[62] See: Questions & Answers - Planning & Peer Review
http://www.cahighspeedrail.ca.gov/faqs/planning.htm
[63] Op. cit
[64] 2008 California High-Speed Train BUSINESS PLAN November 2008; California High-Speed Rail Authority; California High-Speed Train Business Plan; November 2008; pg 7. The source document for this citation probably is: Bay Area/California High-Speed Rail Ridership and Revenue Forecasting Study; Final Repot; prepared by Cambridge Systematics, Inc. August 2007; pg. 2-10, Table 2.3, the Pacheco Pass Alternative. On page 6 CS reports that total annual riders is [sic] 57 million compared to previous 37 million. On page 12 CS reports that the 2000 Business Plan ridership for 2030 was 37 million, but then shows a base of 65-69 million and a range of 65-94 million, depending on the costs of air or auto travel. By page 21, the base had somehow increased to 86-90 million riders, but depending on higher auto or airfares could range as high as 117 million riders in 2030. Why the Prop 1A claim of 93.9 million riders was chosen is not clear. Also see: Bay Area/California High-Speed Rail *Ridership and Revenue Forecasting Study;* Cambridge Systematics, March 2, 2007.
[65] Source: Center for Urban Studies: Wayne State University.
http://www.michigan.gov/documents/hal_lm_census_Projections_Kurt_122858_7.pdf
[66] Source: Table in "Amtrak Fiscal Year 2009" Oct. 2008-Sept. 2009.
[67] Source: Demographica: World Urban Areas & Population Projections: 5th Edition, April 2009.
[68] Op.cit. HSRA Report; December 2009; pg. 68.
[69] Op.cit: Bushell: notes; pg.4.
[70] US Density is 86 people per square mile. Source: World Atlas.com
http://www.worldatlas.com/aatlas/populations/usadensityh.htm
[71] State Senator Alan Lowenthal (D- Long Beach) personally criticized Governor Schwarzenegger for the Governor's decision to solely promote high-speed rail over increased rail safety. *"He told us there would be one state application for the $8 billion in President Obama's rail stimulus program and it would include both high-speed rail and conventional rail improvements."* See: 'Governor Schwarzenegger Put California On The Wrong Track'; California Rail News; December 2009 – February 2010' page 3. The Governor's comments came some 16 months after 25 people died in the September Chatsworth train collision. See:
http://en.wikipedia.org/wiki/2008_Chatsworth_train_collision

[72] Source: Flyvbjerg, Bent; Bruzelius, Nils and Rothengatter, Werner: Megaprojects And Risk, An Anatomy of Ambition; Cambridge University Press, 2003; pg. 26.
[73] Op.cit Flyvbjerg *et al*. pg. 25.
[74] Op.cit Flyvbjerg *et al*. pg. 22.
[75] Private communication with Jean-Claude Guez: Non-Executive Board Director/ Administrateur de Sociétés Internationales; Senior Management Advisor/ Conseiller Expert de Directions Générale: former director of the board of SNCF.; jen-claude@guez.ws
[76] Op.cit Flyvbjerg *et al*. pg. 31.
[77] Paul Amos, Dick Bullock and Jitendra Sondhi; World Bank Report No 55856; July 2010; pg.14
[78] CARRD Ridership Comments; April 26, 2010; pg. 3.
[79] ibid. pg. 6
[80] See: Tomlach, Richard F; "How HSRA gamed ridership data to favor Pacheco Pass route"; September 1, 2010; California Rail News.
[81] Marshall to Schonbrunn Memorandum; April 26, 2010; pg. 12
[82] Memorandum To David Schonbrunn, TRANSDEF; From: Norm Marshall (Smart Mobility); April 26,2010: Subject: California High-speed Rail Model Coefficients Review; pg. 13.
[83] Statement by Samer Madanat; Director of ITS Berkeley; found at http://www.berkeley.edu/news/media/releases/2010/07/01_high_speed_rail.shtml
[84] ibid pg. 1.
[85] The Economist, by NB; July 10th 2010: see: http://www.economist.com/blogs/gulliver/2010/07/high-speed_rail_california
[86] Rich Connell, Los Angeles Times; July 09, 2010: http://articles.latimes.com/2010/jul/09/local/la-me-high-speed-rail-20100708
[87] Whitestone Research: Facility Cost Indices: April 2010: http://www.whitestoneresearch.com/indexes/newcon.htm
[88] Op.cit HSRA Report; December 2009; pg. 110.
[89] Op.cit Flyvbjerg, Bent; Bruzelius, Nils and Rothengatter, Werner: Megaprojects And Risk, An Anatomy of Ambition; Cambridge University Press, 2003; pg. 12
[90] Ibid. pages. 40-41
[91] Op. cit Pickrell, Don; Urban Rail Transit Projects*:*
[92] The project manager for CHSRA is Parsons Brinckerhoff, the same firm that managed Boston's Big Dig.
[93] On September 7, 2010, the Bay Area toll bridge commissioners added another $293 million to the costs of repairing the Oakland-SF Bay Bridge and added another $100 million to the contingency fund in case further costs are as yet unaccounted for. See: Budget for new Bay Bridge span nears $2 billion: Denis Cuff, Contra Costa Times, 09/08/201: Parsons Brinkerhoff (PB), the CHSRA's lead management team together with Bechtel Corporation managed Boston's Big Dig. In 2008, when a driver was killed by a falling piece of the tunnel, Bechtel/Parsons Brinckerhoff, which oversaw the Big Dig design and construction, agreed to pay the bulk of the settlement, $407 million. See: Boston Globe; Big Dig Settlement will take quick hit; Andrea Estes; Globe Staff / January 24, 2008.
[94] Op.cit Flyvbjerg, Bent, *et al*; pg. 15
[95] Op.cit Flyvbjerg, Bent, *et al*; pg. 16
[96] 2008 California High-Speed Train BUSINESS PLAN November 2008; pg. 12
[97] Op.cit HSRA Report; December 2009; pg. 83
[98] Parsons Brinckerhoff, Cambridge Systematics (CS) and SYSTRA: Ridership And Revenue Forecasts; California High-Speed Rail Project; pg.11. Also, a pdf document called More Ridership Information from the CA HSR: pg. 6. Notably this document also says: "*the CS model forecasts are twice those done in 2000: The current forecast for 2030 of 93 million trips (67 million inter-regional and 26 million within region trips) made by Cambridge Systematics (CS) replaces the forecast for 2020 made by Charles River Associates (CRA) in 2000 for inter-regional trips (32 million) and the Authority's estimate of long-distance commuting (10 million)"*
[99] William H. Warren; Analysis of the HSR Planned Pricing V4 100702; July 2, 2010 and William H. Warren; Average Fares V4 100702.xls
[100] ibid.

[101] OECD and International Transport Forum: JOINT TRANSPORT RESEARCH CENTRE Round Table, 2-3 October 2008, Paris; Discussion Paper No. 2009-7; *Competitive Interaction between Airports, Airlines and High-Speed Rail:* May 2009,pg. 14
[102] Addendum to the California High-Speed Rail Authority's "Report to the Legislature; December 2009; Approved by High-Speed Rail Authority Board: April 8, 2010; Submitted April 13, 2010; pg. 40.
[103] In its 2008 Business Plan, the Authority states that the 550 million auto trips between the regions in 2000 was 96% of the total trips. See: Figure 7, page 6. In its 2009 Business Plan, year 2000 auto trips represent 95% of the total. See: page 68.
[104] Op.cit HSRA Report To The Legislature; December 2009; pg. 65
[105] A recent analysis of the ratio of fares to operating costs for twenty-seven US transit agencies found that Austin's system provided only 9%, while Washington's WMATA recovered nearly 62% of its operating costs from the fare box. Los Angeles's LACMTA recovered only 30% while San Francisco's BART recovered 45% and Caltrain 41% of their operating costs from tickets, See:
http://www.ntdprogram.gov/ntdprogram/data.htm
http://en.wikipedia.org/wiki/Farebox_recovery_ratio
[106] Op.cit Statement by Iñaki Barrón de Angoiti; NY Times, May 29, 2009
[107] EU Approves British state aid or high-speed Eurostar line:
http://www.eubusiness.com/news-eu/1242212522.48
[108] Op.cit Amos et al; World Bank Report No 55856; July 2010; pg.20
[109] Japan privatized its rail lines in 1987, selling the high-speed lines for $0.05 for every dollar spent building them. Since then it has built new lines and leased them to the private operators at well below cost. The private companies operate at a profit apparently without operating subsidies. So while Japanese HSR train operators apparently receive no operating subsidies, they received enormous capital subsidies.
[110] Op.cit Amos et al; World Bank Report No 55856; July 2010; pg.1
[111] Sources. ICE ticket fares are from:
http://www.raileurope.com/us/rail/point_to_point/results.htm?rows=&itemId=-1&fn=fsRequest&cobrand=public&c=USD&roundtrip=0&from0=Frankfurt&to0=Berin&deptDate0=08%2F30%2F2010&time0=anytime&nA=1&nY=0&nC=0&nS=0. Distance by land is from: http://www.answers.com/how+many+miles+frankfurt+to+berlin
[112] Sources: For AVE fares:
http://www.raileurope.com/us/rail/point_to_point/results.htm?rows=&itemId=-1&fn=fsRequest&cobrand=public&c=USD&roundtrip=0&from0=MADRID&to0=BARCELONA&deptDate0=08%2F30%2F2010&time0=anytime&nA=1&nY=0&nC=0&nS=0 For land distances: http://www.freedom-tour.com/mall/kmeurope.htm
[113] For Italian ticket fares on Trenitalia:
http://www.raileurope.com/us/rail/point_to_point/results.htm?rows=&itemId=-1&fn=fsRequest&cobrand=public&c=USD&roundtrip=0&from0=MILAN&to0=ROME&deptDate0=08%2F30%2F2010&time0=anytime&nA=1&nY=0&nC=0&nS=0 For land distance: http://www.mapcrow.info/Distance_between_Rome_IT_and_Milan_IT.html
[114] Op.cit Statement by Iñaki Barrón de Angoiti; NY Times, May 29, 2009
[115] TGV ticket prices are from:
http://www.eurorailways.com/products/trains_tickets/parlyo.htm?gclid=CKShlZiqlKMCFQ8mbAodtVO2nA. Land distances are from:
http://gofrance.about.com/library/calculator/bltimedistancecalculator.htm
[116] Edward Glaeser: Running the Numbers on High-Speed Trains: New York Times: August 4, 2009: *"I'll average between 10 and 50 and plug in 30 cents a passenger mile in operating costs, which comes to $72 for a 240-mile trip."*
http://economix.blogs.nytimes.com/2009/08/04/running-the-numbers-on-high-speed-trains/
[117] Pickrell, Don; *Urban Rail Transit Projects: Forecast Versus Actual Ridership and Costs* (Washington, DC: US Department of Transportation, Urban Mass Transportation Administration, 199089).
[118] Federal Transit Administration, Office of Planning and Environment, US Department of Transportation; Contractor Performance Assessment Report: August 2007: Table 6, pg. 24.

[119] Amtrak Reform Council; "*An Action Plan for the Restructuring and Rationalization of the National Intercity Rail Passenger System*"; Government Printing Office, Washington, DC; February 7, 2002; pg. 68.
[120] Transportation Research Board, National Research Council, *In Pursuit of Speed: New Options for Intercity Passenger Transport,* Special Report 233, 1991, Table A-14 (operating cost items only).
[121] Cox, Wendell; Vranich, Joseph and; Moore, Adrian: The California High-Speed Rail Proposal: A Due Diligence Report: Reason Foundation; Policy Study 370; September 2008; pg. 49.
[122] Op.cit HSRA Report; December 2009; pg. 80
[123] Bushell, Alan; 'Operating Expense In The 2009 California High-Speed Rail Authority Business Plan, Perspectives Of A Private Investor; July 22, 2010; pg 5.
[124] Ibid. pg. 5.
[125] Op.cit HSRA Report; December 2009; pg. 82
[126] Op. cit Bushell: notes; pg.5
[127] Eurostar boosts passenger security at Ashford international: http://www.eurostar.com/UK/uk/leisure/about_eurostar/press_release/press_archive_2007/Eurostar_boosts_passenger_security.jsp
[128] Amtrak recently negotiated a 14.87% increase over the next ten years with the increase coming each semester. See: IBEW Local 1573 ET Foremen Explanation of Amtrak Agreement .pdf
[129] GAO, *Intercity Passenger Rail*, November 2006, GAO-07-15, Appendix VI, pp. 150-156.
[130] The three member unions to the Amtrak Service Workers Council (ASWC), voted 450- 116 to accept the five-year contract that provides a total of 15 percent in general wage increases, beginning with a 1.5 percent raise July 1. The pact also caps future health-care contributions, and freezes co-pays and deductibles. See Progressive Railroading Daily News June 22, 2010. http://www.progressiverailroading.com/prdailynews/news.asp?id=23647
[131] Warren, William: HSR Financial Presentation 100607 Version 6.doc; HSR Cash Flows with Financing Alternatives 100607 v6.xls; and Analysis Ticket Prices on Financing V1 100718.doc.
[132] The Warren Model uses $9 billion as the amount the State must service from Prop 1A because $950 million of bond financing authorized by that Proposition is dedicated solely to "independent utility" and therefore does not produce revenues for the CHSR project.
[133] The CARRD analysis is referred to in a CARRD Background paper on "Revenue Guarantee Packet" dated March 1, 2010. It says: *"CARRD did a basic cash flow analysis last May and came to the conclusion that it was very unlikely that the private sector would lend significant amounts of money just on the basis of projected revenues."* page 1.
[134] CHSRA 2009 Business Plan; pg. 108 *"Finally, in order to calculate the total private funding capacity, an after-tax equity internal rate of return (IRR) or investment hurdle rate of 16 percent has been assumed."*
[135] Op.cit HSRA Report; December 2009; pg. 108.
[136] Op.cit AB3034, Chapter 267.
[137] While the Warren model assumes, for calculating purposes, a guaranteed rate of return of 10%; the Authority has assumed " *. .an after-tax equity internal rate of return (IRR) or investment hurdle rate of 16% . ."* See: 2009 Business Plan, page 108. If anything, the Warren model underestimates the exposure the State has to the Authority's assumptions about guaranteeing private equity a return on their capital.
[138] Ibid page. 5.
[139] US Department of Transportation; Bureau of Transportation Statistics; Federal Subsidies To Passenger Transportation; December 2004; Table 4. http://www.bts.gov/publications/federal_subsidies_to_passenger_transportation/
[140] Spain's High-Speed Rail Offers Guideposts For U.S." NY Times, May 29, 2009
[141] See: Amtrak, Office of the Inspector General: EVALUATION REPORT E-08-02 Public Funding Levels of European Passenger Railroads April 22, 2008
[142] ibid. page 4.
[143] Op.cit. Peterman,; Frittelli, and Mallett, W.; CRS; pg.1.

[144] Cox, Wendell; Vranich, Joseph; Moore, Adrian: The California High-Speed Rail Proposal: A Due Diligence Report: Reason Foundation; Policy Study 370; September 2008; pg. 89-90.
[145] Paul Amos, Dick Bullock, and Jitendra Sondhi "High-Speed Rail: The Fast Track to Economic Development?: World Bank Report No 55856; July 2010: Summary; pg.6 - See<http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2010/07/26/000334955_20100726032714/Rendered/PDF/558560WP0Box341SR1v08121jul101final.pdf
[146] Op.cit HSRA Report; December 2009; pg. 108.
[147] Op.cit HSRA Report; December 2009; pgs. 101-106.
[148] Addendum to the California High-Speed Rail Authority's Report to the Legislature; December 2009; Approved by High-Speed Rail Authority Board: April 8, 2010; Submitted April 13, 2010; pgs. 27-28.
[149] Op.cit HSRA Report; December 2009; pg. 82, Table J.
[150] Op.cit AB3034, As Amended in Senate, August 6, 2008: Section 2704.08 C2 (J)
[151] Op.cit For citations of the need for a revenue guarantee see: HSRA Report; December 2009; pgs 101-106.
[152] Another $950 million was allocated for transport projects with independent utility. While not directly part of the CHSR, the State must also service debt from bonds sold for that purpose.
[153] In April 2008, while considering AB3034, the Legislature requested a business plan by September 1st and said ". . *that the business plan be similar to a financial prospectus prepared for investors in new stock or bond offerings and not an advocacy document . . .*" The Legislative Analyst's Office (LAO), page TR-46."*In June 2008, an oversight report by the Senate Transportation and Housing Committee recommended that the business plan be similar to a financial prospectus prepared for investors in new stock or bond offerings and not an advocacy document."* Also see: Assembly Bill 3034, Amended in the Assembly April 9, 2008. Page 12, Section 2704.08 c (1) and (2)
[154] AB3034, As Amended in Senate, August 6, 2008: Section 2704.08 C2 *(J) "The planned passenger service by the authority in the corridor or usable segment thereof will not require a local, state, or federal operating subsidy."* pg. 12. Also see: *"This "50 percent" fare level generates relatively large passenger flows without requiring operating subsidy, and creates large public benefits"* in California High-Speed Rail Authority: Report to the Legislature; December 2009; pg.65.
[155] Op.cit HSRA Report; December 200; ; pg. 82, Table J and pg. 108.
[156] Op.cit HSRA Report To The Legislature; December 2009; pg. 93.
[157] Op.cit HSRA Report To The Legislature; December 2009; pg. 81.
[158] See pg.5 http://www.thsrtc.com/THSRTC%20Newsletter%20-%20May%202010.pdf
[159] When the State Auditor, or the HSRA refer to having secured a quarter of the funds needed, they consider the entire $9.95 of State bonds available. However, the State Treasurer can only sell GO bonds equal to the amount of other, non-State of California funds. At this time the project only has a commitment of $2.34B from an ARRA Grant administered by the US Department of Transportations.
[160] Op.cit Peterman ad Mallett; Congressional Research Service; pg. 25.
[161] Peterman, D; Frittelli, J and Mallett, W.; Congressional Research Service: High-Speed Rail (HSR) in the United States- 7-5700; www.crs.gov; R40973; December 8, 2009; Summary pg. 25.
[162] Op.cit Howle and Cordiner; Report 2009-106; April 29, 2010; pg. 1.
[163] Op.cit Table 4, pg. 13.
[164] Op.cit pg. 26.
[165] Congressional Budget Office; The Budget And Economic Outlook: Fiscal Years 2010 to 2020; January 2010, pg. 13
[166] http://www.apta.com/gap/legupdatealert/2010/Pages/2010July02.aspx
[167] John Hughes, Bloomberg News Service; http://www.bloomberg.com/news/print/2010-07-30/u-s-house-passes-79-billion-funding-plan-for-railways-highway-transit.html
[168] http://www.whitehouse.gov/omb/factsheet_department_transportation/ and http://wsdotfederalfunding.blogspot.com/2010/07/overview-of-senate-fy-2011-transpo-bill.html

[169] Op.cit. Peterman, Frittelli, and Mallett; CRS: High-Speed Rail (HSR) in the United States- 7-5700; www.crs.gov; R40973; December 8, 2009; pg. 12.
[170] CHSRA Press Release, September 30, 2010: "$194 Million Grant to California High-Speed Rail" See: http://dl5.activatedirect.com/fs/distribution:wl/z5jo41w96wtoli/z64qknq3g11m1w/daid/z654b1qxdunnvx?&_c=d|z5jo41w96wtoli|z654b1qxdunnvx&_ce=1285897303.69ae0166fad924129c324a64f3fb850d
[171] Two arguments have emerged against a national high-speed rail system. The first is that the proposed plans assume a great deal of track sharing with freight haulers who own 90% of the US tracks. Trains traveling up to 125 mph can technically use such tracks. Above that speed, as the CHSRA proposes, requires new track technology. But even for slower trains, the freight haulers have insisted that coordinating passenger and freight schedules to avoid accidents is difficult at best. The Union Pacific Railroad (UPRR) has right-of-way rights along portions of the proposed CHSRA route south of San Francisco. In letters of both April 23rd and September 2nd 2010, UPRR once again insisted that the high-speed rail corridor could not include any part of their right of way. [See: Letter to Mr. Dan Leavitt from Jerry S. Wilmoth, GM, Network Infrastructure, UPRR dated April 23rd 2010, and "High-Speed Rail Stalls; Freight Carriers Balk at Sharing Tracks With the Faster Passenger Service"; Wall Street Journal; September 21st, 2010; Jennifer Levitz.] The second argument set is based around the 'pork barrel' politics and cost per passenger mile inefficiencies of the national program. These arguments were articulated in a 'Fact and Comment' article by Editor and Chief, Steve Forbes. See: Forbes.com August 11, 2010.
[172] Op.cit HSRA Report To The Legislature; December 2009; pg. 93.
[173] Op.cit HSRA Report To The Legislature; December 2009; pg. 93.
[174] Op.cit HSRA Report To The Legislature; December 2009; pg. 108.
[175] Op.cit. San Diego Union-Tribune; Sign-on; July 14, 2010 http://www.signonsandiego.com/news/2010/jul/14/u-t-editorial-lockyers-straight-talk/
[176] On the closing of the Shanghai-Nanjing high-speed rail line see: Barbara Hollingsworth; Washington Examiner, July 13, 2010: http://www.washingtonexaminer.com/opinion/columns/Taking-us-on-a-high-speed-ride-to-the-poorhouse-98264104.html On the financial problems of Taiwan's high-speed system see: Benjamin Yeh, "Taiwan High-Speed Rail: From Pride to Embarrassment," The China Post (Taipei), September 28, 2009, http://www.chinapost.com.tw/taiwan/t-business/2009/09/28/226411/Taiwan-High-Speed.htm (March 11, 2010). On the bankruptcy of the Las Vegas monorail, important because it had an investment grade business plan and was a mixture of government and private financing, see: Kyle Hansen, Las Vegas Sun, January 13, 2010; http://www.lasvegassun.com/news/2010/jan/13/las-vegas-monorail-files-bankruptcy-protection/.
[177] See: "Goldman Says Peak in Treasuries Is Past," Wall Street Journal, page C10, Tuesday, October 5, 2010
[178] See "Goldman Says Peak in Treasuries Is Past**,"** The Wall Street Journal, page C10, Tuesday, October 5, 2010
[179] For GO Bonds, Standard and Poor's rating as well as Fitch's is A- while Moody's Investor Services rates California at A1; See: State Treasurer Bill Lockyer, http://www.treasurer.ca.gov/ratings/current.asp
[180] The Meredith Whitney Advisory Group; "Tragedy of the Commons: Launching Ratings on the Top 15 States," See: Mike Milard and Wes Goodman; Bloomberg News; "Meredith Whitney Rates California as Worst, Fortune Reports"; September 29, 2010
[181] The 'wild card' in the State's debt obligation is California's unfunded pension liability. While is not precisely known, it is thought to range from $50 billion to $500 billion. This 'unfunded pension liability' is frequently termed an 'off-balance-sheet' liability. The effects of this could be similar to what happened at General Motors. If combined with 'on-balance-sheet' liabilities, such as GO bonds, can result in a cash solvency crisis. See: "Going for Broke: Reforming California's Public Employee Pension Systems," April 2010 Policy Brief, Stanford Institute for Economic Policy Research.
[182] See: statement by Ellen Greenberg; Mary Williams Walsh, Wall Street Journal; August 18, 2010

[183] The assumption by the U.S. Federal Government of $128 billion of debt from AIG's issuance of CDS on toxic assets is a prime case in point. The worldwide depth of untenable CDO-backed-by-CDS deals is still unknown. See: ISDA®-International Swaps and Derivatives Association; November 2009, "AIG and Credit Default Swaps"
[184] See: http://dealbook.blogs.nytimes.com/2010/05/17/a-scorecard-on-wall-streets-legal-troubles/
[185] There are offices of operators and equipment makers of high-speed rail components from at least eight nations in Sacramento – Belgium, Canada, China, France, Germany, Italy, Japan and the UK.
[186] Assembly Budget Subcommittee No.5 On Transportation and Information Technology; Assembly Member Joan Buchanan, Chair; April 28, 2010.
[187] Chris Cooper and Kiyotaka Matsuda; Japan Offers California Loan to Help Pay for $40 Billion High-Speed Train: Bloomberg News Service; - Sep 13, 2010 http://www.bloomberg.com/news/2010-09-13/japan-offers-california-loan-to-help-pay-for-40-billion-high-speed-train.html On September 16th, Bloomberg News quoted He Huawu, the Railway Ministry's chief engineer as saying *"What other nations don't have, we have"*. See: "China Touts Complete Package" for California Railway by Chris Anstey and Neil Denslow; September 15, 2010. http://www.businessweek.com/news/2010-09-15/china-touts-complete-package-for-california-railway.html
[188] Elaine Kurtenbach (AP) "Schwarzenegger checks out China's high-speed rail," Shanghai (AP) September 12, 2010. See: http://www.google.com/hostednews/ap/article/ALeqM5jvcVDCEpZyt5Bk75vNc98An2CdGwD9I66VNO1.
[189] Op.cit HSRA Report; December 2009; pgs. 70, 82 Table J, 83, 83 Table K, 92, 101, 103, 106, and 108.
[190] Op.cit The Official Voter Information Guide says: *"Vote Yes on Proposition 1A to IMPROVE MOBILITY and inject new vitality into California's economy by creating nearly 160,000 construction-related jobs and 450,000 permanent jobs in related industries like tourism.* ***These are American jobs that cannot be outsourced."*** (emphasis added)
[191] Op.cit HSRA Report; December 2009; pg. 110. *nota bene*, this differs from the 2008 Business Plan which says "Experts calculate about 160,000 jobs will be needed to construct the high-speed train, and more than 320,000 permanent jobs will result by 2030." pg.8.
[192] California High-Speed Rail Authority CHSRA; California High-Speed Train Business Plan; November 2008; pg. 12.
[193] Source: http://www.foxandhoundsdaily.com/blog/michael-bernick/6796-who-will-get-disappearing-california-construction-jobs
[194] Source: "Factcheck on Jobs" – a pdf file, December 2009; by Elizabeth Alexis, Californians Advocating Responsible Rail Design (CARRD). http://www.calhsr.com/
[195] CHSRA 2009 Business Plan: page 110.
[196] Source: US Department of Labor; Bureau of Labor Statistics; Economy at a Glance-California: http://www.bls.gov/eag/eag.ca.htm
[197] Source: Bureau of Labor Statistics: http://www.deptofnumbers.com/unemployment/california
[198] Report by John Chiang, California State Controllers Office, http://www.sco.ca.gov/ppsd_empinfo_demo.html
[199] As of March 31, 2010, Google employed 20,261 full-time employees, and an unspecified number of contractors and part-time employees. Google required less than $50 million to get it to its August 2004 IPO and has been profitable since. The cost per Google employee per $1 million of investment is insignificant compared to the cost per job created by the CHSR. See: http://investor.google.com/corporate/faq.html#employees
[200] Op.cit. HSRA Report; December 2009; on page 80 it says the average employee in 2035, in 2009 $'s, will earn, including benefits, $93,600. But page 81, Table I shows that the total operation and maintenance costs in 2035, in 2009$'s, will be $1,071 million. Of that, the total labor cost, including benefits, will be $634.6 million. By dividing this total labor cost of $634 million by the average earnings per employee of $93,600, there will be about 6,800 employees in 2035. If there are 6,800 Phase I

employees, and if there are ultimately to be 450,000 annual jobs created, it will take about 65 years to provide these 450,000 jobs.