Big Trouble For California's $66 Billion Train

Even More For The 'Entire System' Promised Voters In 2008

– A Briefing Paper from the authors of –

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

For all the authors' publications see: http://www.cc-hsr.org

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Précis: Even if California got every cent of the Obama Administration's six year, $53Billion plan to build a national high-speed rail network that will not be enough to build Phase One from Los Angeles to San Francisco.[1] Today's reality is that the California High Speed Rail (CHSR) project will cost at least $66Billion to construct, and require from $35Billion to $54Billion of private capital. When the costs to borrow and pay back that much capital are brought into the operator's accounts they will create $41Billion to $94Billion of cumulative negative cash flows by 2035; which in turn would necessitate a State commitment to issue bonds or raise new taxes in the range of $149Billion to $204Billion over the next 30 years. Even worse, if the Authority persists in building the 'entire' system, the construction costs will not be the $45Billion promised voters in 2008, but rather $116Billion or more.[2] If the project gets a legally-prohibited 'revenue guarantee'; there is no possibility this project will meet its promises to the voters of *"THE USERS OF THE SYSTEM PAY FOR THE SYSTEM* and *"California's high-speed rail network requires NO TAX INCREASE. ."*

We are grateful to the Community Coalition on High Speed Rail for providing a virtual 'home' for this and our other Briefing Papers, plus our original (October 2010) report *The Financial Risks of California's Proposed High-Speed Rail Project*. For downloadable copies of this and all our work, visit their website **http://www.cc-hsr.org/**

THE AUTHORS

Alain C. Enthoven – Marriner S. Eccles Professor of Public and Private Management (emeritus), GSB Stanford; President, Litton Medical Products; Economist, Rand Corporation; President's Award for Distinguished Federal Civilian Service; Baxter Prize for Health Services Research; Fellow American Academy of Arts and Sciences; Founder, Jackson Hole Group (BA Economics, Stanford; Rhodes Scholar–Oxford; PhD Economics, MIT)

William C. Grindley – World Bank; Associate Division Director, SRI International; Founder and CEO, Pacific Strategies, ret. (B Architecture, Clemson; Master of City Planning, MIT)

William H. Warren – 40 years of Silicon Valley finance, sales and consulting experience, management, including CEO of several start-ups, Director/Officer at ROLM, Centigram, and Memorex (MBA, Stanford)

A 'Rail By Stealth' Strategy – California's High Speed Rail Authority (CHSRA) continues to alter the design of its ill-fated project with incremental changes to what was promised 2008's voters. The CHSRA must hope the changes won't be noticed by the general public or politicians. Their strategy seems to be one of gathering and spending Federal and State monies as quickly as possible so that the rationale will be to continue to spend and not embarrass supporters. That strategy will only drive the project and the State of California off a financial cliff.

If the project were halted soon, it will have wasted 'only' about a half-billion dollars ($500 Million) of the State's scarce fiscal resources. California will have gained nothing more than mostly useless studies and public relations 'spin' that keeps the CHSRA staff and 604 Full Time Equivalent (FTE) consultants spending $1,000,000 per working day. CHSRA substitutes illusions for hard reality.[3] The reality is the CHSRA has no private sector commitment, no local government grants, is constrained to $9.0Billion of State bonds to match Federal or private funds, and will not get much, if any more, in Federal grants.[4]

The Authority's 2009 euphoria, when high-speed rail was portrayed as a job-generating machine propelling America's transport systems into the 21st Century has met the reality of budget crises at every level of the nation's governance. Government grants and loans are scrutinized, Federal 'earmarks' disappeared from Congress' FY2012 budget, and while the Administration has proposed a six-year, $53Billion national high-speed rail program, that sum wouldn't even build Phase One (LA/Anaheim to San Francisco) in California.

Hiding Behind False Promises – To stay in business the CHSRA says that an undefined length of track bed in the Central Valley is the starting point of their 'entire' statewide system. But that negates their 2008 and 2009 business plans to build Phase One linking San Francisco and LA/Anaheim. Their Central Valley costs are not consistent with construction and other capital costs in their Phase One 2009 Plan, and CHSRA is starting a 'section' without an acceptable, investment-grade Business Plan. The 'segments' overlaying their planned 'section', and the 'entire' system is what voters supported; not a useless, debt-generating section of Central Valley rail bed.

In late 2010 the CHSRA 'discovered' that their new construction budget; nearly $3Billion of Federal grants, matched with about $2.5Billion of Prop1A bond monies; was not enough to electrify that rail bed or buy locomotives or passenger cars. That rude fact contradicts their 2009 business plan's capital cost estimates that said they would have enough. Without a high-speed train running on the proposed Central Valley rail bed, the current project produces no revenue but rather about a $2.5Billion financial obligation for Californians, whether rich or poor or near or far from the Train To Nowhere.[5]

CHSRA's financing strategy seems to be to get started with public money to show the private sector the potential returns on their investments (ROI) if they joined up. The Authority has made much of once again calling for statements of private sector interest.[6] However, they are likely to get the same response their Board heard in June 2008. Back then the CHSRA learned that without a guaranteed income on the same

kind of project whose kin around the world require subsidies, private, at-risk capital will not be forthcoming.[7] They have known this for thirty-four months.

But CHSRA's two most egregious pretenses are to continue to say that Phase One (LA/Anaheim to SF) will cost $43Billion to construct; and that, as the promise to voters said in the 2008 Official Voter Guide, *"THE USERS OF THE SYSTEM PAY FOR THE SYSTEM* and *"California's high-speed rail network requires NO TAX INCREASE. . . ."* [8]

Capital Costs Are Up 60% In One Year And Double That Of 2008 – Two early 2011 analyses; produced independent of one another, but both using data from the High Speed Rail Authority's records, arrived at essentially the same conclusions concerning the California High Speed Rail (CHSR) project's Phase One capital costs. Figure 1 compares assertions of the Authority with analyses from Californians Advocating Responsible Rail Design (CARRD) and William Warren, a co-author *of The Financial Risks Of California's Proposed High Speed Rail Project*. [9]

Figure 1
Comparative Phase One –LA/Anaheim To SF – Capital Construction Costs
(Based on California High-Speed Rail Authority data)

	2008 CHSRA Business Plan		2009 CHSRA Business Plan[10]			CARRD Findings (from CHSRA data)[11]			Warren Model (from CHSRA data)		
	Original Track Miles	Total Capital Costs (Ms)	Updated Track Miles	Cost Per Mile (Ms)	Total Capital Costs (Ms)	Updated Track Miles	Cost Per Mile (Ms)	Total Capital Costs (Ms)	Updated Track Miles	Cost Per Mile (Ms	Total Capital Costs (Ms
San Francisco – San Jose	50	$4,612	50	$123	$6,142	50	$175	$8,750	50	$198	$9,895
San Jose – Merced	120	$5,669	124	$56	$6,943	124	$115	$14,272	124	$90	$11,185
Merced – Fresno	60	$2,293	65	$47	$3,008	65	$70	$4,522	65	$75	$4,846
Fresno – Bakersfield	115	$4,655	131	$39	$5,094	131	$85	$11,135	131	$63	$8,206
Bakersfield – Palmdale	85	$4,264	76	$66	$4,998	76	$120	$9,060	76	$107	$8,052
Palmdale – Los Angeles	60	$5,957	60	$127	$7,645	60	$160	$9,600	60	$205	$12,316
Los Angeles - Anaheim	30	$2,184	30	$182	$5,454	30	$160	$4,800	30	$293	$8,786
	Total – $33,625		Total – $42,594			Total – $65,449			Total – $66,595		

Both authors had recognized that in the recent past, CHSRA estimates of building in the Central Valley had increased significantly. Both then asked what might be the Phase One costs based on what they could find from information in the CHSRA's records. To make apples-to-apples comparisons, both analysts eliminated electrification and rolling stock from their reconciliations to CHSRA data, since the proposed Central Valley section has no electrification or capital equipment.

CARRD used data it found in the most recent analyses from CHSRA-employed engineers and costing experts on alternatives. This forensic approach, like the Warren analysis, kept the track mileage equal to CHSRA's most recent plans. As CARRD compared recent engineering reports with 2009 segment costs, they realized the costs per mile of six of the seven segments had increased. The increase was most

pronounced on the San Jose to Merced and Fresno to Bakersfield segments, both doubling in costs. Construction of the Bakersfield to Palmdale segment increased 81%. Only Los Angeles to Anaheim's costs had decreased, that by 12%. CARRD's inductive analysis, which admittedly does not include cost escalations for segments that include long bores for tunnels, finds the Phase One project will cost about $65Billion.[12]

In late 2010, William Warren analyzed cost changes in the Central Valley sections proposed for construction and found that per mile costs had increased significantly above CHSRA's 2009 Business Plan assertions.[13] His approach was deductive: if the per mile costs of the Central Valley have increased by so much, what would be the per mile costs of other segments if they were to increase similarly to those sections? Warren's calculations did not bring the drastic per mile increases per segment, as did the San Jose to Merced and Fresno to Bakersfield segments in CARRD's analysis. Warren found the total Phase One costs to be nearly $67Billion.

What is to be made of two analyses whose conclusions are less than one percent different? Competent and experienced professionals produced both analyses. One is a macroeconomist, the other a former Chief Financial Officer. Both analyses used timely and currently 'accurate' construction cost estimates from the CHSRA's files and public statements. Both had peers review their findings.

Bottom line: while the two authors' findings differ by segment, their results are too similar to be ignored. The $66,000,000,000 average seems a reasonable sum to use to compute the CHSR project's financial impacts.

CHSRA Must Now Raise Between $38 and $54Billion of Private Capital To Build Phase One – A roughly 60% percent increase in one year of Phase One's construction costs, from $43to $66Billion, is extremely significant.[14] As Figure 2 shows, the Authority will have to find private financing for the difference between the $43Billion in their 2009 Business Plan and the new $66Billion estimates – a deeply serious challenge.

The Supplemented 2009 CHSRA Plan Case uses all the Authority's 2009 Business Plan's assumptions, but adds enough private capital to total $66Billion.[15] The Better-Than-Now Case in Figure 2 assumes CHSRA ultimately gains a total of $9.5Billion from Federal and local grants, plus another $10Billion in Federal Loans.[16] That $19.5Billion is assumed to be matched with the complete $9.0Billion from Prop1A authorized bonds.[17] The California High-Speed Rail project (CHSR) would then have a maximum of $28.5Billion for construction.[18] Private debt capital plus private equity (at-risk capital, or with a guaranteed fixed return)

Figure 2
Private Capital Needed
To Build CHSR Project's Phase One – LA-SF

Three Cases	Total Assumed Raised To Build CHSR Project – March 2011	Private, At-Risk Capital Committed – March 2011	Total Private Capital Needed For $66B Project
3A- Supplemented 2009 Case	$31.5B	$0B	**±$34.9B**
3B-Better-Than-Now Case	$28.5B	$0B	**±$37.5B**
3C- Present Reality	$11.9B	$0B	**±$54.0B**

capital would have to supplement that with about $38Billion of the estimated $66Billion construction costs.

The Present Reality Case in Figure 2 is different – it's worse for the CHSR project. If no more Federal grants or Federally backed loans are forthcoming, and California's cities and counties can't or won't donate $4.5Billion to the CHSRA, then the CHSR project will only have what it possibly has now – about $2.9Billion of possible Federal grants and $9.0Billion in matching Prop1A bond funds.[19] That leaves the Authority with the need to attract about $54Billion from the private sector to build Phase One (LA-SF).[20]

What Will It Cost California To Finance The Construction Of A $66Billion Project? – Figures 3A, 3B and 3C show how the private sector investment community might calculate a mix of debt and equity and the annual servicing costs of either $35Billion or $38Billion or $54Billion of private money in a $66Billion project if, and only if as is assumed in this paper, those investments are illegally backed by a State-guaranteed return.

The Supplemented 2009 CHSRA Plan Case – Figure 3A shows what the mix of project costs might be if the CHSRA's 2009 figures reflected not $43Billion, rather $66Billion. With the then-Phase One plan, the Federal, State and Local governments were supposed to have contributed about 75% of the construction costs, none of which would have come from Federal bonds.[21] Without Federal bond monies; even if all government agencies donated their full measure, their contribution would only be 48% of the total $66Billion price tag.

Losing government funds, when $22.5Billion had represented the majority of total financing, changes Phase One's feasibility. Private funds must supplement now-constrained government gifts. In the Figure 3A case, private money is about $35Billion as opposed to the 2009 Plan's assumption of $10-12Billion. Even if guaranteed, tripling private finance, , seriously cripples Phase One's prospects.

Figure 3A – The Supplemented 2009 CHSRA Plan
The Costs To The State of California
Of Building A $66Billion Phase One High-Speed Rail Project

	Amount By Source ($Bs)	Annual Percentage Rate	% Of Total	Annual $Bs CA Requires To Service Finances
CA Bonds	$9.00	5.9%	14%	$0.65
Fed Grants	$18.00	0.0	27%	$0.00
Fed Bonds	$0.00	5.0%	0%	$0.00
Local Gov Loans	$4.50	7.5%	7%	$0.38
Private Debt[22]	$24.15	6.0%	37%	$1.75
Private Equity	$10.35	21%[23]	16%	$2.18
TOTAL	**$66.00B**			**$4.96B**

The-Better-Than-Now Case – Figure 3B outlines the Better-Than-Now Case. The assumption that the Authority can raise $38Billion of private capital by September 2011, and the assumptions that form this scenario to total $66Billion, are very generous to the State and Authority's interests and are:

1) The Federal government donates to CHSRA another $2Billion in grants, bringing the Federal grant total to $5Billion.

2) Although the State must service $9.95Billion of Prop1A authorized bonds, only $9Billlion of that is put in the accounts. The remainder, including interest, is assumed

fully paid into the General Fund by transit agencies using the 'independent utility' portion of Prop1A bond monies.

Figure 3B – Better-Than-Now Case The Costs To The State of California Of Building A $66Billion Phase One High-Speed Rail Project				
	Amount By Source ($Bs)	Annual Percentage Rate	% Of Total	Annual $Bs CA Requires To Service Finances
CA Bonds	$9.00	5.9%	14%	$0.65
Fed Grants	$5.00	0.0%	8%	$0.00
Fed Bonds	$10.00	5.0%	15%	$0.65
Local Gov Loans	$4.50	7.5%	7%	$0.38
Private Debt	$26.25	6.0%	40%	$1.91
Private Equity	$11.25	21%	17%	$2.37
TOTAL	**$66.00B**			**$5.96B**

3) The Federal government loans CHSRA another $10Billion in the form of bonds at 5% with a 30-year maturity.

4) California's cities and counties, individually or together, borrow $4.5Billion in unsecured municipal bonds and grant this to the CHSRA.

5) Private investors supply about $38Billion in debt and equity, in a 70/30 ratio.[24]

6) Private debt is legally 'guaranteed' (secured with State assets) at 6% per annum and equity investors are given an illegal, guaranteed 21% Return on Investment (ROI).[25] These guarantees assume the State does not go bankrupt.

In this Better-Than-Now Case (3B), the private sector assumes 57% of the CHSR project's construction financing, about $38Billion. CHSRA has publically stated it wants private sector capital to join in financing Phase One and had assumed such in their 2009 Business Plan when private financing was only about 25% of the total.[26] But, when private finance is expected to put up over half of every construction dollar, their decision to invest depends on how strong a case can be made for the train's Operating Margins providing an average $4.3Billion annually (the sum of servicing the two private sector contributions) so they profit on their participation.[27] This average annual Operating Margin of $4.3Billion is dramatically (80%) higher than the average annual $2.4Billion Operating Margin in the CHSRA's 2009 Business Plan. But this Better-Than-Now Case creates a very high-risk proposition for private capital.

The Present Reality Case – Figure 3C takes the CHSR project's capital availability from where it is now: about $2.96Billion in Federal grants, and adds all of the State Prop1A Bond monies because it generously assumes the CHSRA gains an illegal guarantee for about $54Billion of private investments.

Figure 3C – Present Reality Case The Costs To The State of California Of Building A $66Billion Phase One High-Speed Rail Project				
	Amount By Source ($Bs)	Annual Percentage Rate	% Of Total	Annual $Bs CA Requires To Service Finances
CA Bonds	$9.00	5.9%	14%	$0.65
Fed Grants	$2.96	0.0%	4.0%	$0.00
Fed Bonds	$0.00	0.0%	0%	$0.00
Local Gov Loans	$0.00	0.0%	0%	$0.00
Private Debt	$37.83	6.0%	57%	$2.75
Private Equity	$16.21	21%	25%	$3.42
TOTAL	**$66.00B**			**$6.81B**

In the Present Reality Case private debt or equity finances 82% of the costs to build the line from LA/Anaheim to downtown San Francisco. Without a State and/or Federal guarantee to pay not only $650Million per year of

Prop1A bond obligations, but also $6.17Billion in returns on the private investments, it will be difficult for private investors who perform due diligence on the project's operations to express interest in what appears to be an extremely high risk proposition.

These jumps in the SF-to-LA/Anaheim capital costs, and their subsequent exposure of any private capital to higher risks are perhaps fatal to the CHSR project. If California's Legislature allows a 'revenue guarantee' to be interpreted as something other than a prohibited operating subsidy, then any capital cost or any Operating Expense can be justified. That's a very different proposition than what voters approved in 2008.

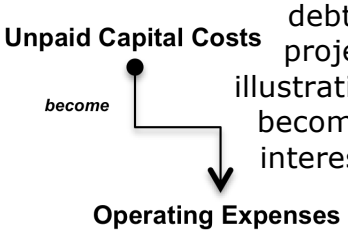
Paying For A $66Billion Construction Bill – Assuming Operating Revenues and Expenses over the 30-year bond amortization period are in balance; that is, Operating Margins are neither negative nor positive, then Figures 3A, 3B and 3C show the annual payments the State will have to make under each case.[28]

Perhaps some of the annual financial servicing costs for construction might be offset if the train's operating authority actually generates enough excess cash to produce a positive Operating Margin (Operating Revenues minus Operating Expenses). But like the construction phase, with a revenue guarantee for operations, there is little incentive to build or operate the system efficiently. This quickly produces negative Operating Margins; aka operating losses. Without a guarantee, operators must prove to their fiduciary overseers that they can produce Operating Margins large enough to also 'pay down' any remaining construction costs.

Financing debt and/or raising equity of $35Billion or $38Billion or $54Billion is possible for profitable, commercially proven, going concerns. It has been done commercially. But raising that amount of private capital for a first-of-its-kind project, when financiers know that every other high-speed rail system in the world requires subsidies, is extremely difficult if not impossible. That is reason this Briefing Paper focuses on the cases where private equity is being guaranteed, ie. a "fixed return", as opposed to being 'at risk'.

Whether the CHSR's operating authority can operate efficiently enough to produce the Operating Margins to amortize the enormous debt and equity burden of a $66Billion construction project, and still meet the promises of " *NO TAX INCREASE. and.. THE USERS OF THE SYSTEM PAY FOR THE SYSTEM*." is explored now. [29]

Finance 101 For Those Who Missed The Class – The challenges of finding $35 or $38 or $54Billion of private capital pale in comparison with what happens when that debt and the State's bonds needs to be serviced in the CHSR project's operations and the State of California's accounts. Here's an illustration of the reason. The capital costs financed during construction become part of the State and CHSR's Operating Expenses – including interest on the debt and dividends on the private equity part of the costs. If you don't fund construction from cash, you must finance the construction; that is, borrow the cash and pay it back, with interest, over a period such as thirty years.



No one escapes that basic financial fact. It's equal to having the construction loan on your dream home 'rolled over' to be part of your mortgage when the builders are finished. For the CHSR project, what isn't paid when operations begin becomes part of their Operating Expenses; the same as the mortgage payment becomes in your case. You and the State must find a way to pay off those debts. After the shenanigans of the subprime mortgage crisis, you must have proof you have the income to make the payments. The CHSR's operating authority must have proof that their Operating Income will exceed their Operating Expenses (ie. create Operating Margin) by enough to pay the financiers; anywhere from $5-$7Billion annually.

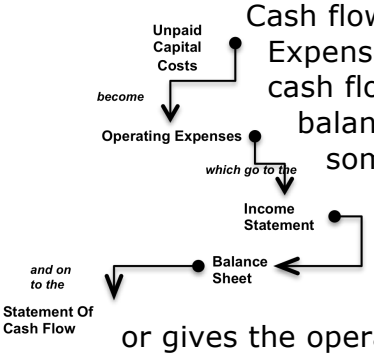
If your income proves it can sustain the payments, financiers are happy to give you a construction loan and then a mortgage on your dream home. For public, revenue-generating projects financed by Revenue Bonds, income from tickets or other sales pays off the construction loan. For General Obligation (GO) bonds, the State is 'on-the-hook' for paying financiers for the CHSR project if it guarantees the operator's revenue. That means the State, not the CHSR operating authority, is at risk to pay financiers between $5-$7Billion each year for generally 30 years. And the State has to do this even if they must cut budgets for schools or universities, the highway patrol, police, parks or prisons to get the money.

If, by any misfortune, you are unable to pay your mortgage, the financier takes your home. It's called receivership and it happened recently to a lot of Americans. What happens if the State can't meet its first constitutional duty to pay its bills? No one will know until it actually happens and essential public services are gone.

Your Credit Card Balance Is More Than What You Spent Last Month: So Too With The State's Deficit – Politicians who speak of high-speed rail's benefits must not understand the damage a CHSR project costing $66Billion to build will do to the State of California's ability to raise money and service its debt. Although some will speak of this year's $20Billion budget shortfall, few speak of the accumulated $140Billion of debt California is committed to repay.[30] But that accumulated debt is like your credit card balance: just because the month or year ends, doesn't mean your debt – or the State's – goes to zero. It's there the day afterwards. And like your Visa or MasterCard balance, it adds up year after year. Drastic budget cuts in FY 2010-11 to California's primary and secondary education, to its universities, R&D and other long-term 'investments' will look small when the reality strikes of having to repay the private creditors who helped build a $66 Billion CHSR project.

Operating Results Add To The CHSR Project's Financial Woes – Prop1A bond service payments, possible Federal loans and private sector loans or equity must be brought over to the CHSR's operating authority and the State's Income Statement. These become part, and only part, of their Operating Expenses. Figure 4 (page 10) displays twelve possible outcomes – stated as the CHSRA does in terms of cash flows – for different mixes of financing and operating results for the CHSR's operating authority.

CHSR's Operations Won't Pay Off A $66Billion Construction Bill – To determine their financial position in the 2009 Business Plan for the $43Billion plan to construct and equip (aka Capital Costs) Phase One, the CHSRA used a cash flow analysis approach, whose results are referred to as an operating surplus. In 2008 the Authority claimed *"The current financial plan assumes that an annual operating surplus of more than $1.1 billion."*[31] A year later the CHSRA said that operating surplus was only a third – $370Million in their first year of operation, increasing to $1.5Billion by 2022, the third operating year.[32] While that's challenged in *The Financial Risks* and *Seven Deadly Financial Facts*, it is even less credible with a 60% increase in construction costs.



Cash flows derive from the balance of Operating Revenues and Operating Expenses, the latter of which includes paying creditors. Cumulative annual cash flows are the year-after-year accumulation of the end-of-year net balances between what an enterprise has taken in and what it pays out; sometimes called cash-on-hand. These sums affect the CHSR operating authority's Income Statement, which in turn flows to their Balance Sheet and Statement of Cash Flow. Unless the State and/or Federal government absorbs and 'writes off' the capital costs (construction plus equipment) of the CHSR project, or gives the operator a 'revenue guarantee' (aka subsidy) necessary to cover those costs, the operator will have to count that obligation in its Operating Expenses.[33] That is how it is in the private sector. And since the underlying legislation to the CHSR project (AB3034) prohibits an operating subsidy; that's how it must be accounted for in the CHSR's operating authority's accounts.

Every Possible Scenario For Paying Off The Debt Of A $66Billion CHSR Construction Project From Operations Simply 'Digs The Hole Deeper' – Each of the twelve scenarios in Figure 4 shows the impact that the costs of debt and equity servicing from the increased construction costs have on cumulative cash flows.

Figure 4
(Based on calculations from the Warren Model)[34]
Negative Cash Flows Facing The State of California Between 2020 and 2035 Of Twelve CHSR Project Financing Scenarios[35]
- Estimated capital cost is $66.6Billion – not CHSRA's 2009 Plan of $43Billion –

Revenues & Operating Expenses (Rev & OpEx) With Various Assumptions Of Ridership and Revenues As Forecast By CHSRA	**3A Supplemented 2009 CHSRA Plan** (includes assumed Federal+ local grants and ±$35B of Private Finance)[36]	**3B The Better-Than-Now Case** (requires ±$38Billion of Private Finance)	**3C The Present-Reality Case** (requires ±$54Billion of Private Finance)
	Cash Requirements Incurred By The State Of California (paid by debt or taxes)		
	A	**B**	**C**
Operating Results # 1 – Same Rev & OpEx as in CHSRA 2009 Plan	*Scenario A1* **($41 Billion)**	*Scenario B1* **($57 Billion)**	*Scenario C1* **($70 Billion)**
Operating Results # 2 – Only 75% of Ridership Achieved (75% of OpEx still allocated)	*Scenario A2* **($51Billion)**	*Scenario B2* **($67 Billion)**	*Scenario C2* **($81 Billion)**
Operating Results # 3 – Ticket Prices Down By 25% (100% of OpEx still allocated)	*Scenario A3* **($58 Billion)**	*Scenario B3* **($74 Billion)**	*Scenario C3* **($88 Billion)**
Operating Results # 4 – Combined Impact of Operating Results #2 and #3 – (OpEx at 75% and Revenues at 56%)	*Scenario A4* **($65 Billion)**	*Scenario B4* **($80 Billion)**	*Scenario C4* **($94 Billion)**

Moving from Column A on the left towards the right, the financing mixes increase the portion of private capital. Yet, unlike earlier, similar tables that addressed $43Billion of construction costs in the *Financial Risks* and *Seven Deadly*

Financial Facts, now there is never a period when the combination of Operating Revenues and Operating Expenses (i.e. Operating Margin) would exceed the costs of servicing the debt and equity.[37] Any mix of finance sources and any plausible performance by the train's operating authority is negated by the $35 or $38 or $54Billion of private investment, as in Figures 3A, 3B and 3C, which becomes the 'financing overhang' of the $66Billion needed to construct Phase One. The operating authority never achieves cumulative positive cash flow.

Even under Scenario A1, using the CHSRA's 2009 operating assumptions with a sixteen-year total of more than 560 million riders in 2020 through 2035 paying an average of $125 (accounting for year of revenue) per ticket, the cumulative negative cash flow has jumped tenfold; from roughly $4Billion in the $43 Billion construction project to $41Billion.[38]

That cumulative negative cash flow is nearly as large as the 2009 Business Plan's entire Phase One construction cost estimate. Under the $43Billion earlier construction estimate, there was a slim chance the CHSRA and the State could have achieved positive cash flow and paid off the $4Billion cash flow deficit in thirteen years. However, under the circumstances where the project will cost $66Billion to build, there is no chance the CHSR operating authority or the State can ever achieve positive cash flow even in Scenario A1, the best of all possible conditions; and even if the returns on private investments were guaranteed by the State and/or Federal government.

Going From Really Bad To Really Worse – In other Figure 4, Column A scenarios, if ridership drops below the expected sum of 560 million in 2020 through 2035, or ticket prices are less than expected, the cumulative negative cash flow builds. If both happen, as in Scenario A4, the cumulative negative cash flow is almost as large as the project's $66Billion capital cost.

Column B Figure 4, where the CHSR's operating authority would have to service $38Billion of private financing, paints a darker picture still. For example, if ridership falters and the train's operator is put into a ticket price war with Southwest Airlines or its competitors, then Scenario B4 suggests the cumulative negative cash flow is another thirty percent higher than Scenario A4.

Perhaps the dark scenarios of Column C Figure 4 will never happen. That may be because even a rudimentary financial analysis by potential arms-length private sector partners will give them enough warnings that the possibility for perfect ridership and perfect ticket prices is not likely to happen. They know that perfect scenarios don't occur; and that unpaid capital costs become Operating Expenses. They know from *The Financial Risks Of California's Proposed High-Speed Rail Project* that Operating Margins, (Operating Revenues minus Operating Expenses) even with 'only' $43Billion of capital costs, do not provide the monies to produce positive cash flows.[39] The Operating Margins on the $66Billion construction project have no chance of meeting the CHSR operating authority's debt-servicing requirements if there is a guarantee on private investments. And with a guarantee, there will be no pressure to contain spending on either construction or operations.

Caution: A Revenue Guarantee Disguises An Eternal Subsidy – A rough picture of what an annual subsidy might be, if the CHSR project is awarded a 'revenue guarantee', emerges from Figure 4 since it addresses the first sixteen years of the CHSR's operations. A simple exercise, shown in Figure 5, divides the cumulative negative cash flows in each of the twelve cells by sixteen years. This gives a 'low ball' estimate of the average annual subsidy in that period.

Figure 5
Average Annual Subsidy Over 15 Years For A $66B Phase One

A	B	C
Scenario A1- $41B **$2.56**	Scenario B1- $57B **$3.56B**	Scenario C1- $70B **$4.38B**
Scenario A2- $51B **$3.19B**	Scenario B2- $67B **$4.19B**	Scenario C2- $81B **$5.06B**
Scenario A3- $58B **$3.63B**	Scenario B3- $74B **$4.63B**	Scenario C3- $88B **$5.50B**
Scenario A4- $65B **$4.06B**	Scenario B4- $80B **$5.00B**	Scenario C4- $94B **$5.88B**

Each of the scenarios' initial construction and capital financial obligations would never be paid off, through the year 2050, when the 30 year repayment schedules were completed. But by that time a very large amount of State debt will have been incurred to pay off the CHSR construction debts.

That means every scenario in Figure 4 requires a subsidy. For example in Scenario C4, by 2035 the State will have incurred $94B in new obligations that must be covered with new debt or additional taxes. And that is only half way through repaying the initial thirty-year obligations. Interest on the new debt in each scenario creates more debt each year. It's like falling behind on your mortgage payments, then renegotiating a 'balloon' payment, only to find you are deeper in debt tomorrow. You never win. With a $66Billion construction bill, the CHSR operating authority never wins. More importantly, California never wins.

Californians didn't vote in 2008 to see this picture emerge. They didn't vote for an annual subsidy of $2.56-$5.88Billion. They were told "THE USERS OF THE SYSTEM PAY FOR THE SYSTEM" in the 2008 election.[40] Their guarantee was that AB3034 explicitly denies the CHSR project an operating subsidy. As shown in Figure 4 of the *Financial Risks* paper, cash flow on a $43Billion project, even when the Federal government supplies $18Billion of grants, is almost always negative. And in the case where construction costs reach $66Billion, that becomes even pronounced. If the floodgates of subsidies open, the promise of "NO NEW TAXES" is broken.[41] This is the frightening bottom line – **IF** the CHSR enterprise is granted a 'revenue guarantee' on $66Billion of construction, Californians will have to subsidize the train's costs forever.

Sticking Californians With The Bill For Phase One – Figure 6 uses the assumptions from Figures 3A, 3B and 3C to calculate both the debt servicing costs, as well as taxes foregone because bond or equity investors must be found for $35 or $38 or $54Billion of bonds to build Phase One. It paints an even more sobering picture than when the project 'only' cost $43Billion. Figure 6 is based on no net Operating Margin to reduce this negative impact on the State. If there is an annual Operating Margin, these numbers reduce the impact on the State's fiscal situation, as shown in Figures 4 and 5.

Figure 6
(From Warren's analysis of track millage in Phase One, and the 'entire' system)
The Costs To The State of California And Its Citizens
From Constructing A $66Billion Phase One High-Speed Rail Project
(Assumes there is no CHSRA Operating Margin to help reduce theses requirements)

Case No. and Description	Annual required of CA to service public + private finances (Bs)	Total to service public + private finances over 30 years (Bs)	Annual State and local taxes foregone (Bs)	State and local taxes foregone over 30 years (Bs)	Annual debt servicing + all taxes foregone (Bs)	Debt servicing and taxes foregone over 30 years (Bs)
Case 3A - as per CHSRA 2009 Plan but with $35B of Private Capital	**$4.96B**	**$149B**	**$0.460B**	**$13.8B**	**$5.42B**	**$162.6B**
Case 3B - Need $38B of private capital	**$5.96B**	**$179B**	**$0.554B**	**$16.6B**	**$6.51B**	**$195.4B**
Case 3C - Need $54B of private capital	**$6.81B**	**$204B**	**$0.630B**	**$19.0B**	**$7.44B**	**$233.3B**

Among the consequences related to financing the capital costs of a $66Billion CHSR project, six should sharpen one's focus for the reason suggested by the 17th Century essayist and playwright, Ben Jonson – "to avoid the hangman":

1) At present the State of California pays approximately $6Billion per year on its entire long-term, fixed interest debt portfolio. Paying creditors is the first Constitutional obligation the State must meet. With no Operating Margin contributions, simply financing the LA-SF Phase One project will add another $5-7Billion under the best three of the CHSRA's operating scenarios if there is no Operating Margin to cover some of these obligations. It would be fair to say that California would at least double its annual obligation to creditors.

2) The 'best case' of $149Billion in financial obligations created to finance a $66Billion Phase One CHSR project would more than double the entire debt the State of California's present $140Billion of GO bonds and other debt exposure that it presently services, and debt obligated-but-not-initiated.[42] A $204Billon obligation would increase the State's present debt servicing obligations one and one-half times because with no Operating Margin, the State would add about $5-$7Billion annually to repay debt created to build CHSRA's Phase One.

3) California would annually forgo about $460–$630Million per year in taxes from tax-exempt bonds.[43] Over the 30-year payback period; that would amount to $14–$19Billion. Politicians are talking about 'investments' in the future, while California's university systems are facing cutbacks of $400 million to the California Community College system, and about a $1.4Billion reduction in support for the three public higher education systems.[44] Paying out more than ten times that to build a train is 'eating the seed corn'.

4) If both annual debt servicing and foregone taxes are taken into account, the annual 'negative cash flow' would range from $5–$7Billion if the CHSR's operating authority produces no consistent Operating Margin. Since no prior plan by CHSRA has convincingly shown a validated Operating Margin, the

worldwide history of high-speed rail says this is genuinely a high risk the State is taking.

5) California is already rated the lowest or second lowest among US states' debt ratings. Moody's Investors Service rates California's GO debt three notches above junk status; Standard & Poor's at the sixth-highest investment grade and Fitch Ratings rates it two notches above junk.[45] The CHSR project's unsettled status forces potential buyers either to demand higher yields or sit on the sidelines. This implicitly forces higher interest rates on all California GO bonds and injures the State's ability to borrow for today's needs.

6) Unless the CHSR's operating authority consistently produces a high enough positive Operating Margin in each of the thirty years of financing the $66Billion Phase One project, the State would be responsible for $163–$223Billion dollars of financial servicing and foregone taxes, explained more fully on page 17, Figure 9.

While these are shocking, they err on the side of being generous to the CHSR project. Californians did not vote for a project that would obligate them to more than a hundred billion dollars of indebtedness. They did not vote for a project with billions of annual indebtedness. They did not vote for a project that would annually at least double their State's payments to creditors. They were told the project would be self-financing. That's what the ballot description said. But they understand that conclusions like those above mean the only way to pay for the high-speed rail dream may be to raise taxes and cut funding for the kind of infrastructure the state's future depends on for good jobs and higher tax incomes that constantly reinvigorate California's past virtuous cycle of growth.

The Costs To Build And Finance The 'Full Monty' – In 2008, Prop1A voters were told; *"The Authority estimated in 2006 that the total cost to develop and construct the entire high-speed rail system would be about $45 billion."* By the 'entire' system, the Official Ballot Description's authors meant the destinations of *". . . the major metropolitan areas of San Francisco, Sacramento, through the Central Valley, into Los Angeles, Orange County, the Inland Empire (San Bernardino and Riverside Counties), and San Diego."* [46]

Although statutorily required by September 1, 2008, when the Authority finally submitted its 2008 Business Plan two months late and after the November election, the price for only about half of the 'entire' system, LA/Anaheim to downtown San Francisco, had already become $33Billion in 2008 dollars.[47] A year later this was restated as nearly $43Billion, expressed in Year of Expenditure (YOE) dollars. About a year afterwards the two independent analysts found the total cost to construct just the LA-SF Phase One was between $65 and $67Billion. Not much of those differences, from $43 in 2009 to $66Billion in 2011, can be laid at the feet of inflation or Year Of Expenditure (YOE) accounting.

Remember the promise to voters that six of California's cities were to be linked by the project? [48] Somehow that morphed into a Phase One, linking only SF, SJ and LA, but adding Anaheim, which was not mentioned on either the Prop1 or the Prop1A ballot descriptions. How was it that Anaheim, the state's tenth largest city, got put in ahead

of the sixth and eighth largest cities (Sacramento and Oakland respectively) that were on voters' ballot descriptions?[49] But neither the voters nor the Legislature, nor then-Governor Schwarzenegger either caught those changes; or if they did, said anything publically about them.

Finally, remember the promise that *"After construction of the San Francisco to Los Angeles segment is fully funded, any remaining bond funds may then be used to plan and construct any of the following additional segments."*[50] Sacramento and San Diego are listed, but there's no mention of Fresno, which was listed on the Official Ballot Description for Prop1A but not on the earlier, certified Official Ballot Description for Proposition 1. Why the difference in the two descriptions?

And why did no legislative or executive body point to Prop1A's description making no mention that Sacramento and San Diego segments were to be built only if the SF-LA segment was fully funded, and there were remaining Prop1A bond funds? That double jeopardy almost insures those large cities would never reap the benefits of their support for the train.

The Phase One 'orphan cities' of Oakland, Sacramento and San Diego aren't likely to ever be destinations using the Prop1A bond monies. Nor will Irvine or the Inland Empire cities named in the Prop1 description. That's because the Borden-Towards-Bakersfield section will use at least $3Billion of the $9.0Billion of State GO bonds that can be used for high-speed rail. A second Central Valley section probably will use another $3Billion, and whatever remains will definitely be used as part of a possible Phase One. Most likely there will be no remaining Prop1A funds afterwards.

A Peek At What It Might Cost To Build The 'Entire System'– Given that construction costs have stabilized or fallen since 2008 it's important to look at what "*the total costs to develop and construct the entire high-speed rail system*" as promised 2008's Prop1A voters to be $45B – would now be in early 2011.[51] Warren took the cost increase ratios he found in the Authority's Borden-Towards-Bakersfield estimates and applied those to segments that complete the entire system. While generous to the Authority, since the new segments exclude inflation that will occur before these segments would be built between 2020 and 2030, the results, shown in Figure 7, are stunning.

Figure 7
Costs To The State of California To Construct
The Entire High-Speed Rail System Promised In 2008

'Entire' System (from Ballot description and CHSRA's Business Plans)	**Est. # of miles per segment**	**Capital costs per mile ($Ms)**	**Cost in Year of Expenditure ($Bs)**
LA/Anaheim to SF Transbay Terminal	**535**	**$124** (avg.)	**$66.6Bs**
Additional cities to be served			
LA-Riverside	56	$209	$11.73
Riverside-SD	101	$97	$9.76
Anaheim-Irvine	10	$290	$2.90
SJ-Oakland	42	$193	$8.12
Oakland-Stockton	75	$97	$7.25
Merced Sacramento	117	$81	$9.42
Totals for additional cities	**401**	**$123** (avg.)	**$49.18**
Build-Out Of Entire Promised CA High-Speed Rail System	**936**	**$124**(avg.)	**$115.78**

If the project proceeds to full term, Californians aren't facing a $45Billion construction bill or even double that. They face paying around $116Billion to build the 'entire' promise. This is two and one-half times the $45Billion in the Prop1A ballot description that voters opted for in 2008.

This jump in the capital costs ($45 to $116Billion) far outstrips the average 45% increase in final costs found by Flyvbjerg, Bruzelius and Rothengatter in their study of 209 megaprojects.[52] It is in the range of the cost overrun for Denver's International Airport, which ultimately cost 2.6 times its estimate.

What Will The 'Full Monty' Cost To Finance? – Since the Authority has no estimates of the Operating Revenues or Expenses later than 2035, there is no basis from which to understand whether operations would decrease or increase the negative cash flows from financing the construction of the 'entire' system. However, knowing that the Operating Margins for the train's operators will not produce enough free cash to pay off a $43 or $66Billion construction cost for Phase One, we can assume their chances of paying off the construction debt for the 'Full Monty' are even lower, if not zero.

But it is possible to know the costs of simply servicing the financial obligations of the construction phase. Figure 8 shows that to build a more-than-900 mile system, the Authority must raise another $50Billion on top of the $66Billion they need for Phase One. That is, they must raise $110Billion. All of this must likely come from private sources that will demand repayment of their investments with interest or dividends.

Figure 8
(From Warren's analysis of track millage in Phase One, and the 'entire' system)
The Costs To The State of California And Its Citizens
From Constructing A $116Billion Phase One High-Speed Rail Project
(Assumes there is no CHSRA Operating Margin to help reduce theses requirements)

Case and Description	Annual required of CA to service public + private finances ($Bs)	Total to service public + private finances over 30 years ($Bs)	Annual State and local taxes foregone ($Bs)	State and local taxes foregone over 30 years ($Bs)	Annual debt servicing and all taxes foregone ($Bs)	Debt servicing and taxes foregone over 30 years ($Bs)
Case 3A - as per CHSRA 2009 Plan but need $35 + $50 = $85B of private capital	**$10.67B**	**$320B**	**$0.99B**	**$29.77B**	**$11.7B**	**$350B**
Case 3B - Need $38 + $50 =$87B of private capital	**$11.66B**	**$350B**	**$1.08B**	**$32.53B**	**$12.74B**	**$382B**
Case 3C – Need $54 + $50 = $107B of private capital	**$12.51B**	**$375B**	**$1.16B**	**$34.9B**	**$13.67**	**$410B**

The three cases discussed in Figure 8 are like Figure 6, based on different mixes of financing, but uses a $116Billion construction cost. The return on both debt and equity would be fixed, as opposed to 'at risk' equity investments. To look at the fiscal impact of an 'entire' system, $50Billion of additional private investment is added to each case; again in a 70%-30% mix of debt and equity. Figure 8 also assumes no Operating Margin. If there were one annually, it would reduce the negative fiscal impact on the State of California.

The chances of building an 'entire' high-speed rail network in California rests almost entirely on whether the private sector will step forward with $87-107Billion of debt and/or equity financing. That's unlikely. The CHSRA has known since June 2008 that no financing would be forthcoming without a revenue guarantee from the State and/or Federal government.[53] They will learn that again.

What Is The Damage To California's Fiscal Situation If It Only Needs To Service Financial Obligations To Build, Not Operate, The 'Entire System' – To step through the CHSRA's looking glass, one needs to suspend reality for a moment and believe the CHSR's operating authority can more than balance its Operating Revenues with its Operating Expenses; ie. it can produce an Operating Margin. Perhaps CHSRA believes it can get a 'free pass' and never needs to service the financial obligations for building the system. This would be an envious, if false position for any enterprise. Even then the numbers in Figure 8, which end up in the billions of dollars, are staggering. Five conclusions:

1) The State would have to commit to repaying $320-$375Billion to build and finance the 'entire' system. That's seven-to-eight times the $45Billion in the Prop1 ballot description.

2) The State would miss out on about $1.0Billion to $1.2Billion every year for 30 years because it will lose taxes due to the tax-exempt nature of California bonds sold to California residents.

3) Every year for 30 years the State would have to pay $11-13Billion to financiers of the 'entire' system's construction.

4) Over 30 years the State will have paid out between $350Billion and $410Billion to financiers for having used their funds to build, not operate the system, assuming there are no Operating Margins to mitigate some of these cash requirements.

5) A California family of four would pay an average of $1,100-$1,300 every year for thirty years to help the State pay off the $116Billon of construction costs. That burden will fall heaviest on working and middle class families. They not only do not have the marginal income to easily absorb that increase, nor will they ride a train that costs of around $1,000 round trip for a family of four to go SF-Anaheim. And they aren't the ones who will avoid State taxes by buying tax-exempt GO bonds.

When what is known about universal subsidies to other nations' high-speed operations is factored into this, the subsidies most probably will increase. Knowledge of what the CHSRA has put forward as their operating plan does not dent the conclusion that, like all those systems, the CHSR operating authority will need deep and continuous annual subsidies.

The CHSR Project Proceeds In The Confident Hope Of A Miracle – What happens even if account is taken of the Authority's forecasted Operating Margins for a projected $66Billion Phase One or a $116Billion 'entire' construction bill for the CHSR project? Figure 9 shows twelve cases. These range from the CHSR operating authority's best case where the 'shortfall' to be covered by increased State debt or new taxes is $2.6Billion annually to possibly its worst case, requiring more draconian means to cover the $12.5Billion annual shortfall.

If the CHSR's operating authority achieves its ridership, and ticket prices, as well as the 2009 Plan Operating Expenses, the Operating Margin would average $2.4Billion annually over the first 16 years (Case 1 Figure 4).[54]

Figure 9 Average Annual Cash Requirement On The State Of California And Its Taxpayers – ($Bs) (For the years 2020 to 2035)				
	$66B Phase One Construction		$116 'Entire' System Construction	
Cases – see Figure 4, for definitions	CHSR Operating Margin ($Bs)		CHSR Operating Margin ($Bs)	
Operating Margins	**$2.4B**	**None**	**$4.2B**	**None**
Case 3A	**($2.6B)**	**($5.0B)**	**($6.5B)**	**($10.7B)**
Case 3B	**($3.4B)**	**($6.0B)**	**($7.5B)**	**($11.7B)**
Case 3C	**($4.4B)**	**($6.9B**	**($8.3B)**	**($12.5B)**

Looking back on the lower construction costs in Figure 6, the annual costs to service the debt on a $66Billion construction program is $5-$7Billion. However if there is an Operating Margin of the size claimed by CHSRA, this leads to a net cash requirement of 'only' $2.6-$4.4Billion per year after the Operating Margin is applied to service the debt and equity in the three cases described in Figure 6. That annual deficit produces a cumulative negative cash flow of $41-$70Billion for the first sixteen operating years, of 2020 to 2035 - see Scenarios A1 through C1 of Figure 4. As scenarios in Figure 4 also show, as Operating Margins drop below the '2009 Plan-perfect', negative cash flow grows quickly.

Now, assume the same perfect world again for the $116Billion 'entire' CHSR project. The mileage increases by 75% as the Phase One system grows into the 'entire' system. Then assume their Operating Margin grows by 75%, from $2.4Billion to $4.2Billion per year. As Figure 9 shows, the annual $10.7-$12.5Billion required to pay for financing the debt and equity would decrease by about $4.2Billion per year. This leads to a net financial requirement on the State (aka California's taxpayers) of $6.5-$8.3Billion per year after the Operating Margin is applied to servicing the debt and equity needed to build the 'entire' system. Or, if there is no Operating Margin, the cash requirements are the $10.7-$12.5 in Figure 8. These represent the range of cases (best to worst) for the State of California and its taxpayers' annual burden.

@%*! Happens If The State 'Winks' And Gives The CHSR Project A Revenue Guarantee – Section 2704.08 (J) in AB3034 disallows *"a local, state, or federal Operating subsidy*." Yet the Authority will try to have 'revenue guarantees' to attract private financing for its capital development and/or its operations. This will be a titanic struggle with equally important outcomes. Arms-length 'at-risk' financing or even public-private financing will be extremely difficult if not impossible to gain if financiers either repeat their 2008 positions and/or conclude from their due diligence that the project exceeds their appetite for risk.[55]

However, if the State allows a 'revenue guarantee' they will have presented Californians with Hobson's choice from which there will be no turning back. At that point any builder or operator can 'low ball' their way into a contract knowing they will be guaranteed their profits. One only has to look at the defense industries to understand that behavior model's outcome. The consequences of guaranteeing the capital financing for a $66 Billion construction project will reverberate for at least the next half-century in California. Worse yet for a $116Billion construction project.

Maybe your mortgage broker 'winked' when you declared your income to get your dream home. To him or her it didn't matter since they still collected their commission. It's similar to a 'wink' of the CHSRA's staff and consultants, those who want to supply the equipment and software, or operate the train. If they have a State 'revenue guarantee' to construct Phase One or operate the trains, they don't suffer the financial consequences. It's like the mortgage brokers' winks that created the subprime mortgage disaster. Those in government and the private sector who understand the financial disaster in the making and might think of granting the CHSR project a revenue guarantee would essentially be 'winking'. But they'd create the same conditions that led to the Great Recession.

Public-Private Partnerships And Federal Grants Are Dangerous To Californians' Pocketbooks And Their State's Fiscal Health – The Authority's much touted Public-Private-Partnerships (P3s) aren't a panacea for the CHSR project's financial distress. Only the most foolhardy private or publically held organization is going to agree to lose money on a CHSR venture where there is not enough coming out of the annual Operating Margins to service the costs of construction, much less operating losses. With the requirements to simply amortize the construction debt shown in this paper, ultimately the taxpayers would have to fund the difference. Or the State will have to default on some or all of its earlier obligations to repay those organizations that agree to build and operate the CHSR system. Constitutionally the State can't do this.

Legislators and taxpayers must understand that 'free' Federal grants aren't free. Accepting, the $18B the CHSRA hoped to obtain, or the $5Billion projected in this document or the $2.96Billion already offered is a Faustian bargain. The consequence is that these Federal funds obligate the State, and therefore its taxpayers, to annual negative cash flows that will have to be financed with more debt or taxes of $2.6-$12.5Billion per year for the next 15 to 30 years.

Walter Bagehot, The Economist's long-ago editor, coined the phrase 'throwing good money after bad' to describe the consequences of investing without the principals risking their own capital. It's appropriate here because as costs have crept up, no one in the Authority, its employ or its Board, the Governor or the Legislature is financially at risk. Or as financiers might say today, they have 'no skin in the game.' Only every citizen of the United States in general and Californians specifically are at risk. If the Federal grants are disbursed for the Train To Nowhere, every US citizen will have contributed $10 of Federal debt and every Californian another $67 of State debt to an undefined length of track bed.

The Big Tax Whammy – If Phase One gets built and $38-$54Billion of private finance is needed, Figure 6 indicates that every Californian will contribute at least $150-$175 yearly simply to finance construction of the $66,000,000,000 CHSR project. That's $600-$700 per year per California family in new taxes to pay for building the LA-SF Phase One.

Likewise, Figure 8 indicates that if the $116Billion 'Full Monty' gets built, every Californian will pay $275-$320, or $1,100- $1,300 per year per family in new taxes for thirty years to have built the supposedly $45Billion 'entire' CHSR project. This will be

extracted in taxes from forty million Californians for a train that middle or working class families won't be able to afford to ride.[56]

California Dreaming Has Turned Into California's Nightmare – The Federal and State governments are ready to spend nearly $6Billion to build a track bed in the Central Valley. Without arguing for repairing aging highways, bridges and rail safety systems, or mentioning the decline in California's once-unmatched education system, the fact that there is little chance of more Federal funding, continuing on the Central Valley sections seems a waste. And now, when we know that Phase One will cost at least $66Billion, proceeding with the CHSR project is to pretend there is something in the world of finance that will bring about a miracle.

It is a harsh reality that Phase One of the CHSR project now requires $35-$38-$54Billion of private finance to build and will never produce enough Operating Margin to pay that down. If the CHSRA's 'Rail By Stealth' strategy works and Phase One is built, Californians will face tax increases to subsidize the construction and operation of their high-speed dream.

That brings the harshest verdicts – **"THE RIDERS OF THE SYSTEM CAN'T POSSIBLY PAY FOR THE SYSTEM"** and **"THERE WILL BE NEW TAXES".**

REFERENCES

[1] For the Official White House version, see: http://www.whitehouse.gov/the-press-office/2011/02/08/vice-president-biden-announces-six-year-plan-build-national-high-speed-r

[2] Official Voter Information Guide for Proposition 1, certified by Secretary of State of State of California; page13. See: http://www.google.com/search?q=Official+Voter+Information+Guide+certified+by+Secretary+of+State+of+State+of+California%2C+Debra+Bowen+Proposition+1a+2008&ie=utf-8&oe=utf-8&aq=t&rls=org.mozilla:en-US:official&client=firefox-a

[3] The Authority's FY2010-11 State budget is $231 million. With approximately 220 working days per year, the average daily cost to Californians is over $1,050,000.

[4] The Authority's 2009 Business Plan for Phase One, LA/Anaheim to SF, required $17-19 Billion of Federal Grants, and $4-5 Billion of local government grants. As of early 2011, the CHSRA had obligations from DOT/FRA for nearly $2.3Billion of grants. That leaves CHSRA with a $21 Billion shortfall, even if the construction of Phase One is 'only' $43 billion. See: California High-Speed Rail Authority (HSRA): Report to the Legislature; December 2009; page 93. To date no private capital has been forthcoming.

[5] This term is not meant to be derogatory, and was first used in a November 2010 letter to DOT Secretary Ray LaHood by Central Valley Congressman Dennis Cardoza.

[6] See: http://www.nytimes.com/gwire/2011/02/10/10greenwire-calif-gauges-private-sector-interest-in-high-s-46780.html

[7] 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*; 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"* See: http://www.cahighspeedrail.ca.gov/images/chsr/20081118152745_Source%20document%209%20rfei.pdf

[8] See: Official Voter Information Guide for Prop 1A (color), page 1: http://www.voterguide.sos.ca.gov/past/2008/general/argu-rebut/argu-rebutt1a.htm. The Official Voter Information Guide for Proposition 1, certified by Secretary of State of State of California, Debra Bowen, say the same regarding "NO NEW TAXES". Also see: page 3 at http://www.google.com/search?q=Official+Voter+Information+Guide+certified+by+Secretary+of+State+of+State+of+California%2C+Debra+Bowen+Proposition+1a+2008&ie=utf-8&oe=utf-8&aq=t&rls=org.mozilla:en-US:official&client=firefox-a

[9] *The Financial Risks of California's Proposed High-Speed Rail Project,* and subsequent Briefing Papers, can be found at the web site of the Community Coalition on High-Speed Rail; http://www.cc-hsr.org/

[10] The 2008 and 2009 CHSRA Business Plans' Capital Construction Costs differ. The 2008 projection, $33 Billion, was done in 2008 dollars, not allowing for inflation. The CHSRA's 2009, $43 Billion, includes inflation, as required by the Federal Railroad Administration (FRA). If the 2009 projection of $43 Billion is 'deflated' back to constant 2008 dollars, the 2009 figures are about $35 Billion, very close to the 2008 Business Plan projection. The two independent 2011 estimates were done consistent with the 2009 Business Plan's use of 'inflated' or 'Year of Expenditure' (YOE) dollars. All 'Totals' in Figure 1 include estimates for train equipment, about $3.3 Billion.

[11] CARRD's full analysis is at their web site. http://www.calhsr.com/uncategorized/what-will-high-speed-rail-cost/

[12] Ibid. At that site CARRD says, *"A new cost number was to be included in a February 2, 2011 updated Business Plan, but that plan has been delayed."*

[13] See: *Seven Deadly Financial Facts For California High Speed Rail Authority*. Found at http://www.cc-hsr.org/

[14] Both authors netted out or kept constant the costs of rolling stock so as to keep year-to-year comparisons accurate. CARRD's range of change was from 54% to 58%, while the Warren analysis range of changes was from 56% to 61%.

[15] See age 93; Report to the Legislature, December 2009; California High-Speed Rail Authority

[16] By the close of 2010 the FRA had allocated, but not dispersed, $2.9Billion of grants to the CHSR project. In this Better-Than-Now Case CHSRA receives another $2Billion. In the CHSRA's 2009 Business Plan cities and counties are assumed to grant the CHSRA $4-$5Billion. Where these grants are mentioned in this paper, $4.5Billion is assumed.

[17] Although 52.7% of Prop1A voters authorized the State to issue $9.95Billion to match Federal and private monies, only $9.0Billion goes to high-speed rail. The remainder is for 'independent utility.'

[18] The total would be something less than $18 Billion because some of the Federal Grants cannot be matched on a one-to-one basis with bonds sold through the Prop1A authority.

[19] This assumes the $715Million granted, not obligated to the CHSRA, will become part of the Federal obligations.

[20] As of the end of 2010, the DOT/FRA had obligated, but not dispersed, $2.34 Billion in grants for the CHSR project. Most of that can be matched on a one-to-one basis with Prop1A authorized monies. The State is committed to raise another $2.34 Billion. Another $715Million has been appropriated but not obligated; the legal hurdle requiring a contract between the US and California.

[21] See: California High-Speed Rail Authority (HSRA): Report to the Legislature; December 2009; pages pg. 93.

[22] In this figure, as in all others, the mix of debt and equity is roughly 70/30. The generous-to-the CHSR project assumption is that more investors would be willing to take an guarantee on their bond returns paying 6% versus a possible at-risk capital pre-tax return of 21%.

[23] Op.cit. 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."* An after tax rate of 16% equates roughly to a pretax rate of 21%.

[24] The working assumption, as inconceivable as it may seem since there is no private investment twenty-eight months after Prop1A, is that private sector participants step in with $26.25Billion of debt and $11.25Billion of equity participation. This roughly $38 Billion is $25-$27 Billion more than the Authority's 2009 Business plan assumed, and is required to make up for the shortfall between $43Billion and $66Billion of funding from the Federal, State or local government sources.

[25] These are the same assumptions the Authority uses. See: California High-Speed Rail Authority (HSRA): Report to the Legislature; December 2009; pages 101-108.

[26] Op.cit.

[27] These returns also presume the private investors have a repayment privilege higher than the Federal Loans and Local Loans taken out to make grants to the CHSR project. However, this assumption is the same as that on page 108 of the CHSRA's 2009 Business Plan

[28] This is extremely generous, given the challenges to the Authority's 39,000,000 ridership forecast for 2030; the indefensibly high assumptions concerning both Operating Revenues coming from those riders, and CHSRA's missing or 'low ball' assumptions concerning Operating Expenses.

[29] Section 2704.08 (J) in Assembly Bill 3034 of August 2008 says *"The planned passenger service by the authority in the corridor or usable segment thereof will not require a local, state, or federal operating subsidy."*
[30] California has about $140 Billion of long term debt: $84 Billion of outstanding long-term debt, at least another $47 Billion in voter authorized but unissued GO bonds (including the CHSR project's $9.95 Billion) and another $10 Billion of Public Works Board lease revenue bonds. While Moody's changed the State's bond rating to A- in April 2010, that reflected a recalibration by Moody's and did nothing to change the State's dubious honor of having the worst General Obligation bond rating in the United States. See: *Status Report on California's Bond Debt; Assembly Budget Hearing*, Bill Lockyer-State Treasurer, December 14 2009. California's debt per resident of about $4,600 is twice its competitor, New York, and three times that of the other top ten indebted states. See: Moody's Investors Service, Inc; California State Treasurer; Thomson Financial; U.S. Department of Commerce, Bureau of Economic Analysis; U.S. Census Bureau.
[31] 2008 California High-Speed Train BUSINESS PLAN November 2008; pg. 12
[32] Op.cit. Page 83, Table K, entitled "*Potential cash flow before and after capital replacement funds at 20 percent of surplus beginning 2031, YOE $$ in billions, initial phase, fare 83% of Air*."
[33] It seems that several HSR-proud governments purchase right of ways, build and equip the systems, or some part of those activities, then turn them over to either an operating authority or a stand-alone track leasing company for high-speed rail systems. The next step seems to be either granting ownership of that capital asset to an operator, or selling or leasing all or part of the assets to the operator at something below market value, or below the original asset development costs. However, the mists of time and creative accounting have clouded the value of the various high-speed rail systems' subsidized assets. For example, Japan's Shinkansen system's assets cost over $250Billion to build. They seem to have been given at a fraction of their costs to the JNR operator, but operating costs seem to have plagued the JNR accounts from the time Shinkansen began. See: Ryohei Kakumoto; Sensible Politics and Transport Theories? Similarly, when the private consortium building what became the Eurostar's rail bed and Chunnel effectively went bankrupt, it seems the governments of France and the UK purchased the assets and essentially have let the operator use them at a nominal charge. This approach also seems to be the case with France's TGV system.
[34] Found at http://www.cc-hsr.org/
[35] Op.cit. *Financial Risks*; See Section 5, Figure 3, page 65, with changes in capital costs to $66.6B, from $42.6B, per estimates by Warren and CARRD of February 2011
[36] That case includes all the assumptions assumed in the 2009 Business Plan on page 83: the full $9.0Billion of Prop1A-authorized State GO bonds, plus the $18Billion of the $19Billion of Federal grants and $4.5Billion of the $5Billion of local government grants. See Figure 3.
[37] See Section 5, page 65 of the Financial Risks of California's Proposed High-Speed Rail Project. This report and all subsequent Briefing Papers can be found at: http://www.cc-hsr.org/
[38] Op.cit. *Financial Risks*. Figure 3, page 65
[39] Op.cit. *Financial Risks*, Figure 3, page 65
[40] 2008 Official Voter Information Guide; (color version – printed after Prop1 was replaced by Prop1A) http://www.voterguide.sos.ca.gov/past/2008/general/argu-rebut/argu-rebutt1a.htm
[41] Op.cit.
[42] See Reference #28
[43] Assumes that purchasers of California GO bonds will be Californians and entitled to tax exemption.
[44] "Proposed budget cuts $1.4B from higher education"; UC Newsroom; January 10 2011. See: http://www.universityofcalifornia.edu/news/article/24764
[45] Quoted from State Treasurer Bill Lockyer as of December 1, 2009. See: http://www.reuters.com/article/2009/12/14/california-debt-costs-idUSN1423724020091214
[46] Official Voter Information Guide for Proposition 1, certified by Secretary of State of State of California doesn't mention Fresno; page13. Found at http://www.google.com/search?q=Official+Voter+Information+Guide+certified+by+Secretary+of+State+of+State+of+California%2C+Debra+Bowen+Proposition+1a+2008&ie=utf-8&oe=utf-8&aq=t&rls=org.mozilla:en-US:official&client=firefox-a
[47] AB3034, SECTION 1. Section 185033 was 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"*
[48] Op.cit: Official Voter Information Guide in Color, page 1. The six cities were: San Diego, Los Angeles, Fresno, San Jose, San Francisco and Sacramento. Oakland disappeared from that list.
[49] See: http://www.citypopulation.de/USA-California.html
[50] Op.cit: Official Voter Information Guide for Prop 1A (color), page 1 (http://www.voterguide.sos.ca.gov/past/2008/general/argu-rebut/argu-rebutt1a.htm.) lists Fresno. However the Official Voter Information Guide for Proposition 1, certified by Secretary of State of State of California doesn't mention Fresno. See pages 12-13 of http://www.google.com/search?q=Official+Voter+Information+Guide+certified+by+Secretary+of+State+of+State+of+California%2C+Debra+Bowen+Proposition+1a+2008&ie=utf-8&oe=utf-8&aq=t&rls=org.mozilla:en-US:official&client=firefox-a
[51] ibid.
[52] See: Flyvbjerg, Bent; Bruzelius, Nils and Rothengatter, Werner: Megaprojects And Risk, An Anatomy of Ambition; Cambridge University Press, 2003; pg. 26.
[53] Op.cit. *Report of Responses to the Request for Expressions of Interest,* October 2008.
[54] The 2009 Business Plan only forecasts expenses and revenues over their first sixteen years of operations (2020-2035).
[55] 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) ; pg. 20. The presentation was given in June 2008, 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 "* pg. 19-20
[56] The basis of this statement is the CHSRA's present SF-LA ticket price model that says a one-way ticket is $105. For a family of four, able to drive the round trip for less than $200 (including fuel, maintenance, insurance license and depreciation), $840 of round-trip rail tickets, with the need to rent an auto on one end of their journey to get to their final destination, is a calculation that middle and working class families will quickly make as not being within their budgets.