

How Realistic Are The CHSRA's Plans To Build From Madera To Bakersfield ?

– A Briefing Paper –

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Overview – By ignoring earlier obligations as well as promises such as starting in Madera instead of 33.5 miles north in Merced, by not building “. . . *high-speed rail alignment* . . .” and by eliminating features of a 220 mph train's infrastructure, the Authority may be able to build a dirt mound from Madera to somewhere north of Bakersfield with the \$6 billion it has in hand.

However, if the cost per mile increases as in other rail projects (45%), the Authority's resources will fall short of the funding needed to build between Madera and Bakersfield. Expectations following CP#1 need to be dramatically lowered AGAIN if more miles are to be built.

The probability of an isolated asset still looms large.

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PUBLICATIONS

All available at www.sites.google.com/site/hsrcliff and at www.cc-hsr.org, then go to Financial Reports

Major Reports on High Speed Rail by the Authors:

- The Financial Risks of California's Proposed High Speed Rail Project (Oct 2010)
- A Financial Analysis Of The Proposed California High-Speed Rail Project (Jun 2011)
- Revisiting Issues In the October 2010 Financial Risks Report (Sep 2011)
- Twelve Misleading Statements on Finance and Economic Issues in the CHSRA's 2012 Draft Business Plan (January 2012)
- California High-Speed Rail Authority's 2012 Draft Business Plan – Assessment: Still Not Investment Grade (January 2012)
- A Partial Catalog of Inappropriate, If Not Illegal Actions in the Conduct and Execution of California's Proposed High-Speed Rail Project – Volume I, March 2012.
- The CHSRA Knows Their Proposed High-Speed Train Will Forever Need An Operating Subsidy (March 2012)
- A Partial Catalog of Inappropriate, If Not Illegal Actions in the Conduct and Execution of California's Proposed High-Speed Rail Project – Volume II, November 2012.
- To Repeat: The CHSRA Knows Their Proposed High-Speed Train Will Forever Need An Operating Subsidy (December 2012)

Briefing Papers:

- Dubious Ridership Forecasts (Oct 2010)
- Six Myths Surrounding California's High-Speed Rail Project (Jan 2011)
- Seven Deadly Facts For California's High-Speed Rail Authority (Jan 2011)
- A Train To Nowhere But Bankruptcy (Feb 2011)
- Big Trouble For California's \$66 Billion Train (Mar 2011)
- Will The Train Benefit California's Middle Class? (Apr 2011)

Brief Notes: Twenty-three one page, single subject papers on various aspects of financial issues related to the proposed high-speed rail system, Oct 2010 - Aug 2011

Any fault found in this report is solely the responsibility of the Authors.

Preface: The California High-Speed Rail Authority (CHSRA) can only acquire and build as much as \$6 billion will buy for the Initial Construction Segment (ICS).¹ It has announced the builder for Construction Project #1 (CP#1).² The northern most point is in Madera: with construction supposedly to continue southward.³ There are a total of five Construction Packages, CP#1 to CP#5, planned for the ICS, consuming all of the available funds. But the Authority's prospects for more Federal funding after the ICS are dim; local governments haven't 'stepped forward' and the private sector is not expected to invest until more than \$20 billion more is found to build the Initial Operating Segment (IOS) – and that Segment proves profitable.⁴

How many miles would their \$6 billion buy in 2009? – In 2009, the entire cost meet to deliver high-speed rail the 168 miles between Merced and Bakersfield was \$6.75 Billion or \$40.2 million per mile.⁵

That estimate included acquiring the land, building a Heavy Maintenance Facility in Fresno, and building, remodeling or rebuilding the infrastructure, including electrification, for high-speed rail train service. However, it did not include the costs of purchasing rolling stock; and in 2012 the Authority admitted the 2009 contingency costs were severely underestimated.

How many miles would their \$6 billion buy in 2012? – The Authority's 2012 Revised Business Plan said their project, "*Begins with construction of up to 130 miles of HSR track and structures in [the] Central Valley*" and "*This first*

¹ The Authority is actually able to spend up to \$6.6 billion. This is because the \$6.0 billion is composed of \$3.3 billion of Federal grants and \$2.7 billion of matching Prop 1A bond funds. However the \$2.7 billion is intended to only meet the various matching obligations under the CHSRA/FRA funding agreement. The Authority could increase the allocation of Prop 1A funds from \$2.7 billion to \$3.3 billion and still be within the Prop 1A requirement that Prop 1A funds cannot exceed 50% of the construction cost. This would increase the total funds available from \$6.0 billion to \$6.6 billion. However, this would still be less than the Low or the High 2012 estimated cost projections presented herein as Exhibit D.

² It is unclear whether the \$985 million CP#1 design-build bid of the consortium led by Tutor Perini (TP) is meaningful. TP must upgrade the 15-30% level of engineering estimate that their bid was based on before putting its assets at risk to build what is a legally obligated price. How that is done without raising (or lowering) the bid price is not clear.

³ See: California High-Speed Rail Project; Request for Proposal for Design-Build Services; RFP No.: HSR 11-16, Scope of Work, Attachment 2, Limits of Work Map. There are recent indications that CP#1 may also build northward from Madera.

⁴ The Authority says the private sector will be willing to invest via purchase of a concessionaire's rights after the IOS is proven profitable. However, no indication is given as to what entity will operate the IOS's train that will supposedly prove profitable. No assessment has been made of what happens if the train is not profitable and California owns a 'white elephant.'

⁵ See: California High-Speed Rail Project: Cost Changes from 2009 Report to 2012 Business Plan Capital Cost Estimates; April 2012; prepared by Parsons Brinckerhoff. FN 3, page 28 says; "*The 2009 Report to Legislature includes a single cost estimate of \$6.75 billion for Merced to Bakersfield.*" The 2009 costs between Merced and Fresno were \$2.55 billion: the Fresno to Bakersfield was \$4.2 billion. Using the Authority's inflation factor of 4.76% between 2009 and 2011, the \$6.75 billion would be \$7.2 billion in 2011 dollars.

construction segment will cover up to 130 miles **of new high-speed rail alignment** from just north of Bakersfield to north of Fresno.” (Emphasis added.)

⁶ With hindsight those 2012 statements said:⁷

- 1) No mileage commitment is made: the Authority will build whatever number of miles its \$6 billion can afford. That makes a construction contract open-ended since there is no mileage performance specification.
- 2) There was no specific start point, since “north of Fresno” could mean Madera, Chowchilla or Merced or further north. Sometime in early 2012 the Authority selected to build the shortest: Madera towards Bakersfield.⁸
- 3) The 33.5 miles from Merced to Madera in the 2012 Plan is ‘off the table’ for CP#1. No explanation is given, but it saves precious funds.⁹
- 4) Supposedly high-speed rail alignment, track and structures, and their complementary operating and safety-related systems, will be built.

But a concomitantly released 2012 Plan’s technical document suggests a far more sober assessment of what might be done between Merced and Bakersfield than the rosy picture of “ . . . will cover up to 130 miles of new high-speed rail alignment . . . ” IF the Authority was comparing apples-to-apples, Exhibit A would show the 2009 estimate and a 2012 range of low-to-high range estimates of \$9.65 billion to \$13.55 billion for the entire cost to deliver high-speed rail the 168 miles between Merced and Bakersfield.¹⁰ [More on apples-to-apples later.]

Exhibit A – Estimated Costs and Costs Per Mile for Merced to Bakersfield									
	2009	Est.	Est. 2012	Est.	Est. 2012	Est.		Avg. 2012	Est.
	Estimate	Cost /mile	Low Range*	Cost /mile	High Range*	Cost /mile		\$s – 2009-‘11 % Increase	Cost /mile
	\$ Billions	\$ Millions	\$ Billions	\$ Millions	\$ Billions	\$ Millions		\$ Billions	\$ Millions
Merced-Fresno (58m)	\$2.55B	\$43.9M	\$3.55B	\$61.2M	\$6.45B	\$11.2M		\$5B 96%	\$86.2M
Fresno-Bakersfield (110m)	\$4.2B	\$38.1M	\$6.1B	\$55.5M	\$7.1B	\$64.5M		\$6.6B 57%	\$60.0M
Total-Merced - Bakersfield (168 miles)	\$6.75B	\$40.2M	\$9.65B	\$57.4M	\$13.55B	\$82.4M		\$11.6B 72%	\$69.0M

⁶ See: Building California’s Future: California High-Speed Rail Program, Revised 2012 Business Plan, April, 2012, Exhibit ES-3 (pg. ES-13) and page 2012 respectively.

⁷ For references to what is to be built, consult California High-Speed Rail Project; Request for Proposal for Design-Build Services: RFP No.: HSR 11-16; Book 1, Part A: Instructions to Proposers, Initial Release dated March 19th 2012.

⁸ According the Google Maps, driving distance between Madera and Bakersfield is 131 miles. According to Google Maps, the driving distance from Merced to Bakersfield is 164 miles, but if each of the driving distances between the two city centers is entered, the total is 168 miles. Since the train shall go close to the centers, that is the mileage used.

⁹ According to Google Maps, the driving distance between Merced and Madera is 33.5 miles. If the average of the 2012 estimated range of costs is \$86.2 million per mile (shown in Exhibit A) the savings is \$2,887,931,034.

¹⁰ To the 2009 estimate of \$2.55 billion for the Merced to Fresno section the Authority increased the “estimated capital costs of \$1.0 to \$3.9 billion (36% to 139% increase)” resulting in that portion costing between \$3.55 and \$6.45 billion. To the Fresno to Bakersfield reported 2009 estimate of \$4.2 billion the Authority increased the “ . . . estimated capital costs of \$1.9 to \$2.9 billion (43% to 66%).” See: pages 26-28 of California High-Speed Rail Project: Cost Changes from 2009 Report to 2012 Business Plan Capital Cost Estimates; April 2012; prepared by Parsons Brinckerhoff.

Based on the 2009 Plan and the Authority’s 2012 technical document, how many miles south of Merced would the Authority’s \$6Billion have been able to acquire land and build instead of the “up to 130 miles” promise of 2009? Exhibit B answers that question.

Exhibit B Percent and Miles of Merced to Bakersfield CHSRA Able to Complete Using \$6Billion In Hand Funds		
	Percent	Miles
2009 Estimate	89%	149
Low Range 2012	62%	105
High Range 2012	44%	74
Avg. Est. 2012	52%	87

Some observations on the varying probability of the CHSRA’s project getting to Bakersfield from Merced:

1. By 2012 the Authority thought it could build “up to 130 miles” of the 168 miles between Merced and Fresno. The former 2009 promise of going most of the distance from Merced to Bakersfield was certainly speculative.
2. By 2012, the lower range estimate (\$9.65B) shows the Authority can acquire and build about 105 miles between Merced and Bakersfield for \$57.4 million/mile – 62% of the distance between Merced and Bakersfield.
3. If the cost per mile of the 168 miles between Merced and Bakersfield is the average of the estimated ranges, \$9.65-\$13.85 billion (\$11.6 billion), or \$69 million per mile, then they could acquire and build the 87 miles between Merced and Bakersfield.
4. If the cost per mile of the 58 miles between Merced and Fresno is the higher of their estimates (\$6.45 billion), their cost per mile would be \$11.2 million/mile. This would allow the Authority to go 74 miles between Merced and Bakersfield, or 44% of the distance between Merced and Bakersfield.
5. If their average cost per mile (\$69 million) increases no more than the 45% average for rail projects around the world, the cost per mile would be \$100.1 million per mile.¹¹ At that rate, the Authority could only acquire land and build about 60 miles between Merced, and Bakersfield, about a third (35%) of the distance between Merced and Bakersfield.

Any of these conclusions from the technical document would define the 2009 goal of going from Merced to Bakersfield as creating an isolated asset. All of these conclusions show that, even in 2012, the \$6 billion would have created an isolated asset, since at best the monies available would only achieve about three-fifths (62%) the distance between Merced and Bakersfield. It is also most likely that cost overruns (45%) would mean only about 60 miles between Merced and Bakersfield would be built.¹²

¹¹ See: Flyvbjerg, Bent; Bruzelius, Nils and Rothengatter, Werner: Megaprojects And Risk, An Anatomy of Ambition; Cambridge University Press, 2003, page 37.

¹² Such a scenario would leave downtown Fresno torn up with unfinished overpasses and incomplete infrastructure

All of these conclusions show that the 2012 Business Plan, in differing so drastically from its underlying technical documents, is more a marketing and public relations document than an investment grade business plan. Again.

What infrastructure would get built for \$6 billion if CHSRA attempted to comply with the Merced-to-Bakersfield promise? – Here is where the apples-to-apples comparisons become important. The April 2012 Business Plan said, “*Begins with construction of up to 130 miles of HSR track and structures in Central Valley*”¹³ But the technical document and the Requests For Proposal (RFP) say quite different things.

First, Merced will not be the northern most point. Madera will be. Madera is 33.5 miles south of Merced. If the average of the 2012 estimated range of costs is \$86.2 million per mile (shown in Exhibit A) the Authority’s additional cost to start in Merced would have been \$2.9 billion. If the Merced-to-Madera portion overran its per mile estimate 45% like other rail projects resulting in a \$100.1 million per mile cost, that would have cost the Authority another \$3.5 billion. The Authority probably saved half the monies it has in-hand by eliminating the Merced-to-Madera, which would have included the ‘Y’ to San Jose and Merced, portion.

Second, the power supply of high-speed rail, electrification, is not part of the ICS construction phase. In the 2009 Business Plan, electrification was 5.6% of the total construction cost estimates.¹⁴ By eliminating electrification from the 2012 Business Plan, the Authority lowered its 2009 cost ranges by \$400-\$600 million for the ICS.¹⁵

Third, the plans and budgets for the ICS lack critical elements needed for high-speed or conventional rail functionality. The ICS presently encompasses no rolling stock (locomotives and passenger cars), no station in Madera; and unless the project somehow reaches all the way to Bakersfield, there will be no station in Bakersfield.¹⁶

Fourth, 2012’s estimates did not include the Heavy Maintenance Facility.¹⁷ The 2009 Plan for Merced to Bakersfield did. The 2012 estimates eliminated \$600 million (including contingencies).

¹³ See: Building California’s Future: California High-Speed Rail Program, Revised 2012 Business Plan, April, 2012, Exhibit ES-3 (pg. ES-13)

¹⁴ See 2009 CHSRA Business Plan, page 85, Table 2, Capital Costs By Item

¹⁵ The electric power supply system is scheduled only when the IOS, from Merced to the San Fernando Valley is completed. Applying the 5.6% to the 2009 Low and High estimates, shown in Exhibit D, of \$7.6 billion to \$9.8 billion would lower the cost for the ICS to about \$7.2 billion to \$9.2 billion.

¹⁶ There are stations planned for Fresno and for the Shafter-Wasco area.

¹⁷ “The portion attributable to the Merced – Fresno Section is ~\$2.5 billion. The ~\$2.5 billion cost estimate also includes the Heavy Maintenance Facility. The Low and High Range cost estimates do not include the Heavy Maintenance Facility.” See: page 26 of; California High-Speed Rail Project: Cost Changes from 2009 Report to 2012 Business Plan Capital Cost Estimates; April 2012; prepared by Parsons Brinckerhoff.

Fifth, the output will not be "HSR track and structures in [the] Central Valley" as required by AB3034, as in the 2008, 2009 and 2011 Draft Revised Plans, and as promised voters in 2008.¹⁸ Rather, a conventional rail infrastructure will be partially laid only from Madera to Fresno and possibly further towards Bakersfield – based on the remainder of the \$6 billion of Federal and State funds.¹⁹ The consequences of this slight of hand are financially significant, but impossible to calculate since no 220mph-rated track has ever been built in the United States.

Sixth, whatever is built gets connected to the existing freight rail owners' track, which currently supports Amtrak. This is a *de facto* admission that the project has morphed from high-speed rail to an upgrade of Amtrak infrastructure: not what California's Legislature had in mind, not what 2008's voters approved.

*The segment will become operational by allowing Caltrans [ie. Amtrak CA] to operate expanded San Joaquin service between Bakersfield and Merced on the first IOS section. To achieve this, track connections would be built to connect to the BNSF Railway line at the northern and southern ends of the first constructed segment.*²⁰

No citation for the costs of "*the northern and southern ends of the first constructed segment*" could be found in the Authority's cost estimates. However, the Federal government, in its grant agreement with the Authority, will cover those costs.²¹

Seventh, given there is a very high chance of cost overruns, the initial work from Madera to Fresno and south towards Bakersfield will likely not have rails.²² In the Scope of Work for Construction Project #1 (CP#1) the Authority admitted that the contractors are not building a high-speed rail track bed, supporting infrastructure, nor placing rails on the trackway.

¹⁸ See: Building California's Future: California High-Speed Rail Program, Revised 2012 Business Plan, April, 2012, Exhibit ES-3 (pg. ES-13).

¹⁹ See: California High-Speed Rail Program: Revised 2012 Business Plan, page 2-14.

²⁰ See: California High-Speed Rail Program: Revised 2012 Business Plan, page 2-14. The statement goes on to say that technology on the BNSF section would be upgraded to allow faster conventional rail service. It is unclear whether BNSF was aware of this statement when filing its letter with the Surface Transportation Board.

²¹ See page 43 of Grant/Cooperative Agreement No. FR-HSR-0009-10-01-05. Found at: <http://www.cahighspeedrail.ca.gov/assets/0/79/103/c90bbbf4-fa19-4278-9799-058742907ed9.pdf>
"To comply with FRA requirement for assuring operational independence, an Interim Use Reserve has been established for the Project. The Interim Use Reserve includes a connection on each end of the initial construction section in the Central Valley with the Burlington Northern and Santa Fe Railway Company (BNSF) mainline plus associated positive train control (PTC), and interim station (i.e., Amtrak) capital costs, totaling \$108 million. The funds allocated to this Interim Use Reserve are to be 100% Federal funds."

²² Bent Flyvbjerg, "Quality Control and Due Diligence in Project Management: Getting Decisions Right by Taking the Outside View," International Journal of Project Management (November 2012), <http://dx.doi.org/10.1016/j.ijproman.2012.10.007>.

*The Scope of Work does not include construction of the portion of CHSTP trackway performed by Caltrans as stated above; trackwork itself; passenger stations; buildings; right-of-way engineering, negotiations, and acquisition; soundwalls (except the soundwalls along the Roeding Park in downtown Fresno, which shall remain in Contractor's scope); and systems work (i.e., Overhead Contact System poles, foundations, and wires; Traction Power Facilities; Automatic Train Control; etc.). The Scope of Work excludes civil/site works for said future CHSTP systems facilities and ancillary sites, unless noted otherwise. . "*²³

How much was saved by eliminating the above-cited trackway, stations, building, right of ways, systems' work and other aspects of a 'true' high-speed rail system is unknown. But it must count in the several hundreds of millions of dollars. In the portion due to begin in July 2013, even laying conventional rail track won't happen. CP#1 is nothing more than a very long dirt and rock mound; clearly not ". . . HSR track and structures . . ." ²⁴ According to the Authority's map for the Request for Proposals, this means a considerable portion of Madera and Fresno will be torn up with the dirt and rock mound sitting there until more environmental approvals are forthcoming. ²⁵ The prospect that the entire length of the Initial Construction Section (ICS) will meet the same fate is very real. ²⁶

In short, the Authority was able to reduce their 2012 estimates for the Merced to Bakersfield portion of their project by \$3-\$4 billion. More 'savings' probably should be added to that by truncating the promised features. But there is no basis for comparing high-speed rail construction to conventional rail construction in the USA, and the 2012 technical document was vague in more than one place about what did or did not appear in the 2009 Plan.

Put conversely, the Authority eliminated \$3-\$4 billion, enough to bring down costs; but ignoring (or hiding) the fact that some, if not much of these costs will have to be added later if it is to deliver on its 2008 promises to voters.

²³ See: California High-Speed Train Project, RFP No. HSR11-16; page 10 of 38; Book 2, Part C - Scope of Work

²⁴ See: Building California's Future: California High-Speed Rail Program, Revised 2012 Business Plan, April, 2012, Exhibit ES-3 (pg. ES-13)

²⁵ See: California High-Speed Train Project; Request for Proposal for Design-Build Services, RFP No.: HSR 11-16; Attachment 2, Limits of Work Map.

²⁶ Once CP1 is started, the Authority plans three more similar construction packages, CP#2, CP#3 and CP#4, to build "track ready" conventional rail infrastructure, going south towards Bakersfield. Then a CP5 construction package will be let to install track, signaling, stations, etc., needed for Amtrak service. But no HSR electrification is included in the ICS. All of this is to be accomplished by the presumably to-be-available \$6Billion. It is very likely that CP4, and maybe CP3's mileage will need to be dramatically shortened to conserve funds to wholly or partially complete CP#5 and its critical tracks, signaling, and stations.

What is the impact of starting in Madera instead of Merced? – Exhibit C shows 2009 costs to go from Madera to Bakersfield. Exhibit D shows the Authority’s 2012 estimated costs for the same mileage. Exhibit D also shows the effects of ignoring earlier plans and promises, calculating more realistic inputs; but ‘saving’ 33.5 miles of work between Merced and Madera, and more.

Exhibit C – Madera to Bakersfield – 2009 Estimates			
	Miles	Est. Cost/mile	2009 Est. Cost
Madera to Fresno	24	\$43.9 million	\$1.06 billion
Fresno to Bakersfield	110	\$38.2 million	\$4.20 billion
Madera to Bakersfield	134		\$5.26 billion
Exhibit D – Madera to Bakersfield – 2012 Low + High Estimates			
	Miles	Est. Cost/mile	2012 Est. Cost
Madera to Fresno	24	\$61.2 - \$111.2 million	\$1.47 - \$2.67 billion
Fresno to Bakersfield	110	\$55.5 - \$64.5 million	\$6.10 - \$7.10 billion
Madera to Bakersfield	134		\$7.57 - \$9.77 billion

Taking the average of 2012’s low and high range estimates (\$7.57 - \$9.77 billion) of \$8.67 billion, the project’s cost between Madera and Bakersfield increased nearly two-thirds (65%) in a little over two years.²⁷ If either becomes reality, the \$6 billion will not cover the costs between Madera and Bakersfield. This may well be a harbinger of things to come.

Conclusions – By ignoring earlier obligations as well as promises such as starting in Madera instead of 33.5 miles north in Merced, by not building “. . . *high-speed rail alignment* . . .” and by eliminating features of a 220 mph train’s infrastructure, the Authority may be able to build a dirt mound from Madera to somewhere north of Bakersfield with the \$6 billion it has in hand.

However, if the cost per mile increases as in other rail projects (45%), the Authority’s resources will fall short of the funding needed to build between Madera and Bakersfield. Expectations following CP#1 need to be dramatically lowered AGAIN if more miles are to be built.

The probability of an isolated asset still looms large.

²⁷ The 2009 Plan was issued in December 2009: the Revised 2012 Plan in April 2012, a difference of twenty-eight months.