

The CHSRA Knows Their Proposed High-Speed Train Will Forever Need An Operating Subsidy

CHSRA was told several times that the proposed train's operating costs may be about three or four times more than their current projections.

March 17th 2012

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PUBLICATIONS – All available at www.cc-hsr.org

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)

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 to present

The Authors appreciate the untold hours spent by many citizens groups and individuals that formed this analysis. However, any fault found in this report is solely the responsibility of the Authors.

OVERVIEW

CHSRA insists loudly that the High Speed Rail service will be run at a profit from an operating point of view (not counting capital construction expenses); therefore HSR will not require operating subsidies. They reach this conclusion because they dramatically understate operating costs, which our analysis shows will be much higher.

The CHSRA Business Plans have correctly set their ticket pricing to be competitive with air travel and gasoline prices in California. As these competitive prices are lower than similar prices overseas, the CHSRA is forced to operate at a lower revenue per passenger mile rate (about 20 cents), compared to their international counterparts (at about 44 cents). Therefore, if the CHSRA operating costs do approach international rates of 40 to 50 cents per passenger mile, as opposed to the Authority's "projected" rate of 10 cents, future Legislatures and future Administrations will have to provide annual subsidies in the range of billions of dollars. This will not be legal under Section 2704.08 (c) (2) (J) and Section 2704.08 (d) (2) (D) of AB 3034 and it will force the Legislature every year to make cuts to other programs to accommodate operating subsidies to High Speed Rail.

At that point in time who will be held accountable?

SUMMARY

1. THERE IS MOUNTING EVIDENCE THAT THIS IS A SERIOUS PROBLEM THAT IS NOT BEING ADDRESSED

Studies by BBVA, which the CHSRA references, show operating costs per passenger mile are in the 40 cents range and confirms our conclusion of 2011. A Spanish presentation to the Board in 2011 provided pricing and costing information that reaffirmed this 40 cent cost range. The 2012 Draft Business Plan presents an operating cost projection that is in the range of 10 cents per passenger mile. CEO Van Ark reaffirmed the Business Plan projections at a US Congressional Hearing.

2. THERE ARE MANY UNASKED AND UNANSWERED QUESTIONS

How can the Business Plan be based on costs that are 25% of international cost structures? Why were the BBVA studies and the Spanish presentation price and cost data not present in the Business Plan? How does Mr. Van Ark's testimony reconcile with the BBVA and Spanish information?

3. IF THIS PROBLEM IS REAL, HOW SERIOUS IS THE PROBLEM?

If the Business Plan operating costs rise from the projected 10 cents per passenger mile to the international average of about 40 cents, annual losses will be in the range, annually, of \$2Billion to \$9Billion YOY.

4. SO, WHAT ARE THE MESSAGES?

The US marketplace will not allow for international ticket pricing at about 40 cents per mile, so subsidies are going to occur. This set of conclusions should have been reached by the CHSRA a year or two ago.

5. CONCLUSIONS

The Administration and the Legislature need to accept the need for subsidies, which are not legal under AB3034, and understand the impact on the General Fund over future years. The alternative of higher ticket prices will most probably dramatically reduce the passenger volumes and the role of HSR in California.

6. HOW TO PROCEED

These conclusions need to be validated by independent groups of the State government, before construction begins.

THERE IS MOUNTING EVIDENCE THAT THIS IS A SERIOUS PROBLEM THAT IS NOT BEING ADDRESSED

1. In Mid 2010 we concluded from pricing data from the international HSR providers that there was an operating cost problem.

Brief Note #14 and #15¹, and Section 2.6 (pgs. 28-29) of **Revisiting Issues In the October 2010 Financial Risks Report²** contains an analysis of the per passenger mile ticket prices in Europe, Japan and Amtrak's Acela. The charges are remarkably consistent; from a low of 34 cents per passenger mile in Italy to 50 cents in Germany and Japan. The USA Acela's per passenger mile ticket price, 44 cents, is right in the middle. Even discounting the fact that the operating costs in Europe are subsidized to a greater or lesser degree – as discussed on **Brief Note #6 and #10³** – it seems logical to conclude that the average 43 cents is a reasonable estimated per passenger mile operating cost at which a high-speed system could operate. In comparison, as discussed below, the CHSRA projections of operating costs show they are estimating they will manage their service at about 10 cents per passenger mile.

2. A detailed BBVA study, which the CHSRA had access to, shows that international operating costs are in the 45 cents per passenger mile range, raising serious questions about the alleged "profitability" of international HSR systems.

Our finding, above, with respect to international operating costs is confirmed by a July 2009 BBVA report, *Economic Analysis of High-Speed Rail in Europe*.⁴ This report is a more recent version of a 2007 report that Parsons Brinckerhoff references on page 7, footnote 3 of their *Estimating High-Speed Train Operating & Maintenance Cost for the CA HSRA 2012 Business Plan*, of October, 2011. This report is available on the CHSRA Web site. In both the 2007 and the 2009 BBVA Reports there are the same operating and maintenance costs for 2002 for eleven different HSR systems around Europe. An analysis, shown in Figure 1, of the eleven European systems' operating and maintenance costs, in Euros, and converting to miles and dollars yields operating and maintenance costs per seat mile of 28 cents and 03 cents respectively. Inflating from 2002 dollars to 2010 dollars, yields a combined operating and maintenance expense of 48 cents per passenger mile, assuming a 75% passenger load factor⁵. It should be noted that our analysis is simply an un-weighted average of the average costs provided in the BBVA report for each of the eleven systems, as there is insufficient data to do a proper weighted average of all the European carriers. However, it is noteworthy that the two lowest cost train systems in the BBVA reports, the two types of French TGV "double deck" trains that are used on the Paris to Lyon corridor, have a cost of about 31 cents per passenger mile, still three times the projected CHSRA costs of 10 cents per passenger mile.

It is also helpful to break these sets of data into two groups, the French and German systems, as "Mature Systems" in the 2002 time period, and the Italian and Spanish as "New Systems". This shows that the large fleets with years of experience, had costs that average about 44 cents per passenger mile, while the newer, smaller fleets had costs in the range of 59 cents per passenger mile.

These two BBVA Reports, and their data set, which have been in the public domain since 2007 and 2009, allow us to project that average European high-speed rail operating costs, in 2010 \$s, per passenger mile are in the range of 45 cents to 50 cents, including the efficiencies of the "double deck" French trains which are at about 31 cents per passenger mile. This validates the analysis of the 2011 report, **Revisiting Issues In the October 2010 Financial Risks Report**, that even with revenues in the range of 43 cents per passenger mile, operating costs per passenger mile exceed revenues per passenger mile across Europe. This finding is consistent with public testimony that international high-speed rail operations are subsidized as shown in Brief Notes #6 and #10, and the '**Revisiting**' report.

It is also consistent with the frequently made claim that the French Paris to Lyon segment is profitable. That may very well be true, since they have the lowest operating costs per passenger mile due to use of the "double deck" train sets that are needed to carry the passenger volumes on this segment. As stated in Brief Note #14, our analysis showed that the lowest adult fare per passenger mile in

2011 was 40 cents per passenger mile, for Paris to Lyon. Compared to our projected operating and maintenance cost of about 31 cents per passenger mile, it shows an operating margin of 9 cents per passenger mile. Now, to get a true perspective of operating margin, one would need to be sure no other operating and maintenance costs are being absorbed by other entities of the French government. As mentioned on our Brief Note #10, it is not clear what costs are being absorbed by the RFF (Reseau Ferre de France) which may, or may not, be included in the BBVA report.

What is important is to put just these "best case" French numbers in perspective - operating costs in the range of 31 cents per passenger mile, compared to the CHSRA plan of operating costs of about 10 cents per passenger mile. How can the CHSRA plan to operate a HSR system for 33% of what the French are spending on operations?

Also note that while the French have revenues in the range of 40 cents per passenger mile, the CHSRA plans to collect revenues in the range of 20 cents per passenger mile. In effect, the CHSRA plans to operate at 33% of the operating costs of the French train systems, and therefore the CHSRA will be able to sell tickets at 50% of the price of the price the French are charging on a per passenger mile basis.

3. A Spanish presentation to the CHSRA Board provided validating costing information.

In the June 2011 CHSRA Board Meeting a presentation was provided by the Spanish government regarding the Spanish HSR system. One of the presentations, "RENFE Company Profile and Development of HSR Services" contained detailed pricing information and summary costing information.⁶

Information was provided to the CHSRA Board and to CHSRA CEO Mr. Van Ark (who attended the Board Meeting) on the two types of long distance HSR which were reported to be "profitable", and one regional HSR system which is subsidized by the Spanish government. When the ticket price data in the presentation is converted to dollars per passenger mile and averaged out for the various classes of services, such as Club (First Class), Business, and Tourist, the two long distance HSR systems have 2010 or 2011 ticket prices in the range of 45 to 65 cents per mile. They also reported that they have a 19% "profit" margin on the Madrid to Barcelona segment. Accepting this profit margin representation and extrapolating it to the two long distance systems, it leads one to conclude that the operating costs for these two long distance systems are in the range of 40 to 50 cents per passenger mile. This range of Spanish operating costs is very similar to the projections of the 2009 BBVA study, discussed above, which reports European operating costs in the range of 45 cents to 50 cents per passenger mile. This examination of this presentation shows that it lacks sufficient detail to draw any specific conclusions regarding the Spanish prices and costs, other than to say it is very apparent that the costs are in the ranges of 40 to 50 cents per passenger mile. It also

important to note that the operating costs have dropped from the 59 cents per passenger mile in the 2002 time period (in the BBVA report) to the 45 cents to 50 cents in the 2011 Spanish presentation. This occurred while the traffic for the two long distance systems grew from 3.5M passengers in 2002 to about 11M passengers in 2010.

All of these cost numbers are a far cry from the Authority's projected cost of 10 cents per passenger mile.

4. The Draft 2012 Business Plan ignores all of these indicators and continues to use an artificially low cost-per-mile estimate, therefore creating an illusion of operating profit in the system's forecast.

Five months after the Spanish Board presentation the Authority continued to claim, in the 2012 Draft Business Plan, that their operating expenses are essentially half their 19 cents of revenue per passenger mile for the LA to SF trip. [Based on the 425 miles between Los Angeles and San Francisco and their \$81 ticket.] This computes to operating costs of about 9 cents to 10 cents per passenger mile. This is somewhat better than their 12 cents of revenue and 6 cents of operating costs in their 2008 Plan – which was based on telling voters in the first ballot description they could travel that same route for “about \$50.”⁷ However, even raising the one-way SF-LA ticket charge to \$81 in the **CHSRA Draft 2012 Business Plan** means that with their projected 50% operating profit (margin) the Authority's estimated operating costs per passenger mile are still less than one fourth of the actual average per passenger mile operating costs in Europe, and one about third of the “best in breed” results of the French HSR systems.

5. CHSRA testimony reaffirmed their Business Plan operating costs projections.

Lastly, in testimony before the US House Subcommittee on Railroads, Pipelines and Hazardous Materials, on December 15, 2011, Mr. Van Ark provided additional perspective on this issue. In response to a question from Representative Gary Miller of California, Mr. Van Ark said that all of the price and cost projections in the 2012 Draft Business Plan have been checked and crossed checked against all the systems in the world. His testimony is available via video, at the end of a 5 minute video clip.⁸

It is not clear how his statement is consistent with the information provided in the 2007 BBVA Report referenced in the Business Plan Operating Cost document produced by Parsons Brinckerhoff, see above, or the Spanish presentation to the CHSRA Board in June of 2011.

THERE ARE MANY UNASKED AND UNANSWERED QUESTIONS

1. How can California's proposed train have operating costs that are one fourth that of Europe when the European systems' operating costs are clearly subsidized (prohibited under AB3034) and the **Draft 2012 Business Plan** states

that US labor costs – a major component of operations – are higher than in Europe? For example, the California Amtrak's Pacific Surfliner and San Joaquin reported last year revenue of 25 cents per passenger mile and operating costs of 44 cents per passenger mile⁹.

2. Why were these BBVA 2007 and 2009 publically available studies not used as reference documents in the CHSRA's December 2009 and the 2012 Business Plans, showing that there is a substantial difference between the historical European costs per passenger mile results and the projected CHSRA costs per passenger mile results? If there are legitimate arguments why such an operating cost difference is a reasonable assumption, it should be plainly stated so that the Legislature, responsible for ensuring no operating subsidy is required, could understand the situation.

3. Why was the pricing and costing information in the 2011 Spanish presentation to the Board not incorporated into the Draft 2012 Business Plan? Once again, if there are legitimate arguments for a cost difference, they should be plainly stated for the Legislature.

4. How can there be such a serious disconnect between the House of Representatives testimony of Mr. Van Ark and these two BBVA 2007 and 2009 Reports and 2011 Spanish Presentation, each with their included sets of contradicting information?

IF THIS PROBLEM IS REAL, HOW SERIOUS IS THE PROBLEM?

The magnitude of the problem is stunning. Figure 2 shows the amount of risk that is built into the current Business Plan as the Operating Costs are extremely understated.

There is an important caveat that needs to be noted. The following analysis assumes the ridership forecasts adopted by the CHSRA, yet we also recognize these forecasts have been challenged by knowledgeable forecasters. That being said, if the ridership is less, as many of the operating and maintenance costs are to a great extent fixed and cannot be reduced to match the lower level of ridership, the operating costs as a percent of revenue will be greater than the projected 50%. Therefore the operating profit (margin) as a percent of revenue will be less than the projected 50%. Was this to be the case, the result will be even greater operating deficits. With that said, let us turn our attention to the current Business Plan projections.

There are four blocks of data presented in Figure 2, representing Revenues and Operating Costs and resulting Operating Profit (Margin). On the left the numbers are in 2010 \$s, on the right the numbers are in Year Of Estimate (YOE) \$s.

1. The current Business Plan projections

The first block of data provides the three rows of the Revenues, Cost and

Profits (or Loss) taken directly from the **Draft 2012 Business Plan**. These work out to about 20 cents per passenger mile in revenues, and with a 50% profit margin, an operating cost per passenger mile of about 10 cents.

2. The last block, matching international operating costs

Dropping down to the bottom three rows, the last block of data, is where the Operating Costs have been increased by a factor of 4, to get to an operating cost of about 40 cents per passenger mile, "roughly" equal to the raw (un-weighted) average of the operating costs for the "Mature Systems" in Europe. (See Figure 1) Big annual subsidies will be required, in 2010 \$s in the range of \$1Billion to \$3Billion per year, in YOE \$s in the range of \$2Billion to \$9Billion per year.

The real problem is that it appears the CHSRA revenue per passenger mile numbers are in the correct range, given the air fares and prices of gas in the US, compared to the much higher air fares and gas prices in the international market place. Therefore, higher operating costs will lead to operating losses, as there is little opportunity to increase ticket prices dramatically.

There is a detailed Pricing Analysis on the CC-HSR Web site, as Appendix A of the 2010 Financial Risks Report. We recommended that the ticket prices in the 2009 Business Plan needed to be dropped from \$105 for San Francisco to Los Angeles to between \$82 and \$83. See pages 3, 4, and 12. In the 2012 CHSRA Business Plan the new price was set at \$81.

Therefore, the CHSRA can not just decide to raise prices 100%, which is what they would have to do (just to break even), if their costs are really going to track the international operating costs.

3. The third block, achieving costs as low as the French

What if the CHSRA can keep their operating cost from going up to the international costs of about 40 cents per passenger? In other words, what are the results if the CHSRA can "do better" than the average international market? Maybe they can do as well as the lowest cost segment identified in the BBVA Report mentioned above, which are the French "double deck" trains, such as the ones used on the Paris to Lyon segment. They are at about 31 cents per passenger mile. (See the top two rows of Figure 1) So if the CHSRA Authority could get down to operating costs as low as the "best in breed" in Europe, they will only lose, annually, \$0.5Billion to \$1.5Billion in 2010 \$s, or \$1.0Billion to \$4.0Billion in YOE \$s. This is shown in the third block of numbers, which looks at 30 cents per passenger mile operating costs.

4. The second block, having operating cost lower than anyone

Finally, what if the CHSRA could get to one half of the international cost per passenger mile number, which is 2/3s of the French number? Then the CHSRA will be at about break even. This is shown in the second block of data.

In summary, if the CHSRA has operating costs similar to the International "Mature Systems" they will lose many Billions per year. If they can get their cost down to the "best of breed" French system, they will lose fewer Billions per year. If they can operate at half of the cost of the international systems, which seems unlikely in the extreme, then they will just about break even. Can they deliver their currently projected cost structure, which is one quarter of the international "Mature Systems"? It is our opinion that the answer is "No".

SO, WHAT ARE THE MESSAGES?

1. There is a MAJOR structural problem that has been hidden from view. It seems inevitable that CHSR will not be profitable and will require operating subsidies, which AB3034 makes illegal.

The ability to get revenues per passenger mile high enough to cover "international like" operating costs is probably impossible given the competitive prices in the US marketplace. The CHSRA has had too much focus on the "ridership model"; the real issue is the lower ticket prices required in the US marketplace compared to existing cost structures in the international marketplace.

2. There was incomplete staff work done, or presented, to the Administration and the Legislature with respect to the business model.

There are two ways to prepare a cost estimate. The first way is "bottom up", where some of 'this cost' and some of 'that cost' are added together, and presented as what it will cost to produce a product or a service. The second way is "top down" by taking existing cost structures that currently provide similar goods or services and then deciding how one's proposed product or service will be different in its cost structure. For example, the "bottom up" approach would show the cost of energy, on a cost per passenger mile basis. If there are dramatically lower costs of energy in the US, that would materially lower the operating cost per passenger mile, this could be an adjustment to lower the European cost per passenger mile to a more realistic cost per passenger mile in the US marketplace. When these two approaches converge on a similar cost estimate, there is a reasonably good chance most of the needed components of the "bottom up" approach have been incorporated in the estimates, and the differentiations in the "top down" approach that allow for a difference from existing cost structures are identified, so they can be managed to, and hopefully achieved.

Clearly, the Parsons Brinckerhoff Cost Estimate Report, mentioned earlier,

followed the “bottom up” approach, and came up with a cost structure that is in the 10 cents per passenger mile range. It is not evident that the “top down” approach was used at all, because it would have produced a “big red flag” that existing cost structures are in the 40 cents per passenger mile range. And nothing was said about how the CHSRA will be able to provide reliable and safe service at one fourth the European costs. Clearly, it appears no convergence occurred.

The CHSRA and Parsons Brinckerhoff clearly had access to these several international studies and reports which should have alerted them to the apparent disparity between the European operating costs and their projected operating cost. Their “bottom up” costing approach has led to a cost structure that now appears to be one fourth that of the international marketplace, which ought to indicate that they have missed something or grossly underestimated one or more of their cost centers. If they had also taken a “top down” approach as a validity check on the “bottom up” approach maybe this issue could have been identified sooner. If Parsons Brinckerhoff did do some “top down” analysis, it should have been made available to the Administration and the Legislature. This seems to have been a serious lack of convergence.

CONCLUSIONS

1. To date both the Legislature, the Administration, and the CHSRA have ignored these two issues.

The US marketplace will force HSR ticket prices to be lower than existing international ticket prices on a per passenger mile basis.

The 2009 and 2012 Business Plan projected operating costs bear no correlation to the existing international operating costs on a per passenger mile basis.

However, they were first presented in both **Brief Notes No. 14 and No. 15** of August 2011, as well as in Figure A (page 17) of **Revisiting Issues In the October 2010 Financial Risks Report** of September 2011. With about \$600,000 per day being spent by the CHSRA in 2012 to design and plan for this \$100 Billion investment, it is hard to understand why this issue can not/will not be addressed by Sacramento.

2. In the months since the **Draft 2012 Business Plan** was issued, no legislative body has even asked whether such a ‘low-ball’ operating cost estimate is responsible; much less demanded to be shown independent, validated, evidence of its adequacy. That inaction has once again let the CHSRA avoid the ‘Elephant in the Living Room’. The counter argument that these “operating details” will be sorted out once an operator has been selected is self serving. This is not a “detail”. This is at the core of AB 3034 (no subsidy) and the CHSRA is proceeding with projections that appear to fly in the face of current day reality.

3. Another classic example of a lack of responsibility is the lack of a contingency plan if the operating costs do not turn out to be in the range of the Authority's projected 10 cents per passenger mile, but closer to the international marketplace's actual operating costs which are in the 40 cents, and higher, per passenger mile range.

This issue truly does appear to be the "Elephant in the Living Room", for if the costs turn out to be higher, future Administrations and Legislatures will need to provide a subsidy from the General Fund to operate the HSR system, which will be against the provisions of AB 3034. These annual subsidies will be in the Billions of dollars per year, as shown in Figure 2. There does not appear to be any other rational contingency plan available. When the current Administration and Legislature fund the construction phases they are, by definition, accepting this future subsidy as the contingency plan for the risk of operating cost overruns.

4. The Administration and the Legislature could step back from the defined marketing objective of capturing 40 Million passengers per year with a pricing model that is competitive against air fares and gasoline prices. As discussed above, this report focuses on Revenues and Operating Expenses in the CHSRA forecasts. We generally agree with the Business Plan when it says that CHSRA ticket prices must be competitive with air fares and gasoline prices, and therefore we accept the forecasted ticket pricing. But as this report shows, such pricing will inevitably lead to operating deficits if one accepts our higher forecasted operating costs per passenger mile. It must be added, however, that CHSRA could significantly increase ticket prices, and therefore revenue, in order to cover the higher operating expenses we forecast. Our quick modeling suggests ticket prices would need to increase from 50% to 100% from what they are currently forecast.

The point being two-fold: (1) ticket prices could likely track Europe's and Acela's, being geared for business travelers and the wealthy, and be much less accessible to middle class and lower income people; and (2) nobody at CHSRA has presented what ridership, and breakeven financials, would look like if:

Prices were raised 50% if operating costs could equal the two French "best of breed" train systems of 30 cents per passenger mile. This would mean prices rise from 20 cents to 30 cents per passenger mile, and a San Francisco to Los Angeles ticket would go from \$81 to \$122

Prices were raised 100% if operating costs could equal the average of the Mature Systems in Europe and be about equal to the Acela system pricing of about 40 cents per passenger mile. This would mean prices rise from 20 cents to 40 cents per passenger mile, and a San Francisco to Los Angeles ticket would go from \$81 to \$162

As far as we can tell, the Business Plan activities and its prerequisite ridership forecast have not considered such a high ticket price model, but clearly this would result in much lower ridership and also would result in ticket prices that are out of the reach of many families, which has been one of the touchstones for

many in the Administration and the Legislature as they review the CHSRA proposition.

Neither systemic outcome – operating subsidies in the first case or a system that only the wealthy can afford in the second – seems an appealing way to invest \$100 billion that will never be recovered through operations and must therefore be paid for by the taxpayers of either the United States or California.

HOW TO PROCEED

The impact of these four issues is that it is not clear how to proceed, other than to stop the project. Before considering stopping the project it would seem prudent for the Administration and the Legislature to expend financial and independent staff resources to validate the analysis provided in this Report or to validate the CHSRA's current cost projections. This will require travel overseas to collect source data that can be known to have a verifiable audit trail. However, compared to a CHSRA "burn rate" of about \$600,000 per day, it would appear to be a reasonable investment.

If this Report's assertions prove to be valid, the State has a serious problem if it goes forward with this project. The marketplace will not allow ticket prices to be raised to cover the operating costs that will be similar to the international costs. It would take a miracle to hold operating costs at one half of international costs, to just, hopefully, break even. The results will be 1) a lack of positive cash flow from operations to help fund the construction of subsequent segments, and 2) operating subsidies that AB 3034 prohibits and that Prop 1A promised voters would not happen.

¹ Available at www.cc-hsr.org

² Available at www.cc-hsr.org

³ Available at www.cc-hsr.org

⁴ Ginés de Rus (Editor), Ignacio Barrón, Javier Campos, Philippe Gagnepain, Chris Nash, Andreu Ulied, Roger Vickerman; Economic Analysis of High Speed Rail in Europe; Fundacion BBVA, Informes 2009, Economica y Sociedad. See:

<http://www.fbbva.es/TLFU/tifu/ing/publicaciones/informes/fichainforme/index.jsp?codigo=424>

⁵ In response to a question asked by a CHSRA Board member, Juan Matias Archilla Pintidura of the Spanish RENFA stated that the Load Factor on the Spanish HSR system was between 70% and 80%. This occurred at the June 2, 2011 presentation of the RENFA HSR system at the CHSRA Board meeting. The presentation is on the video of the Board meeting, about one hour into the meeting. The video is available at: http://stateofcalifornia.granicus.com/MediaPlayer.php?publish_id=30

⁶ RENFE Company Profile and Development of High Speed Rail Services, presented to CHSRA Board June 2, 2011, see pages 17, 33, 34, 36, and 50. Available at:

<http://www.cahighspeedrail.ca.gov/assets/0/152/232/f8663924-d330-4abf-ba2d-e295d2546db7.pdf>

⁷ See pg. 2 of the (first) Official Voter Information Guide of August 28, 2008 at:

<http://www.voterguide.sos.ca.gov/past/2008/general/argu-rebut/argu-rebutt1a.htm>

⁸ See US House testimony of Mr. Van Ark via video at: http://www.youtube.com/watch?v=IXDeu_4-AXs&feature=youtu.be

⁹ See Amtrak 2011 Annual Reports at:

<http://www.amtrak.com/servlet/ContentServer?c=Page&pagename=am%2FLayout&p=1237608345018&cid=1241245669222>

Figure 1

HSR Operations and Maintenance Costs in Europe, 2002

From:
Economic Analysis of High Speed Rail in Europe,
BBVA Report, 2009 - Table 1.3

Different Train Types		Operating Costs		Maintenance Costs		Combined Operations and Maintenance Costs	
		<u>2002 Euro per seat- KM</u>	<u>75% Load Factor 2010 \$ per passenger mile</u>	<u>2002 Euro per seat- KM</u>	<u>75% Load Factor 2010 \$ per passenger mile</u>	<u>75% Load Factor 2010 \$ per passenger mile</u>	
France	TGV Reseau	0.0927	\$0.31	0.0080	\$0.03	\$0.34	
	TGV Duplex	0.0776	\$0.26	0.0050	\$0.02	\$0.28	
	Thalys	0.1478	\$0.50	0.0110	\$0.04	\$0.54	Mature Systems
Germany	ICE-1	0.1240	\$0.42	0.0090	\$0.03	\$0.45	\$0.44
	ICE-2	0.1766	\$0.60	0.0090	\$0.03	\$0.63	
	ICE-3	0.1026	\$0.35	0.0090	\$0.03	\$0.38	
	ICE-3 Polyc	0.1212	\$0.41	0.0100	\$0.03	\$0.44	
	ICE-T	0.1206	\$0.41	0.0140	\$0.05	\$0.46	
Italy	ETR 500	0.1605	\$0.54	0.0180	\$0.06	\$0.60	New Systems
	ETR 480	0.1526	\$0.52	0.0230	\$0.08	\$0.59	
Spain	AVE	0.1532	\$0.52	0.0180	\$0.06	\$0.58	\$0.59
	Sum	1.4294	\$4.84	0.1340	\$0.45	\$5.29	
	<u>Data Points</u>	11	0.1299	0.0122	\$0.04	\$0.48	
	<u>KM per Mile</u>	1.6093	0.209121	0.019604			
	<u>\$ per Euro</u>	1.3459	\$0.2815	\$0.0264			
	<u>Load Factor</u>	75%	\$0.3753	\$0.0352			
	<u>Inflation per year 2002 to 2010 factor</u>	2%	\$0.44	\$0.04			
<u>Total of Operating and Maintenance Costs, per Passenger Mile in 2010 \$s</u>			\$0.48				

Figure 2

Variations of Operating Costs and Margins from IOS North to Complete Phase One

Approximate Per Passenger Mile (\$/mile)	Million \$, in 2010\$'s					Million \$, in YOES's				
	<u>2025</u>	<u>2030</u>	<u>2040</u>	<u>2050</u>	<u>2060</u>	<u>2025</u>	<u>2030</u>	<u>2040</u>	<u>2050</u>	<u>2060</u>
Current 2012 Draft Business Plan										
0.20 Revenues	487	1,280	2,271	2,387	2,510	759	2,312	5,513	7,788	11,001
0.10 Operating Costs	307	629	1,236	1,254	1,131	478	1,136	3,000	4,091	4,958
Operating Profit	180	651	1,035	1,133	1,379	281	1,176	2,513	3,697	6,043
Operating Costs times 2										
0.20 Revenues	487	1,280	2,271	2,387	2,510	759	2,312	5,513	7,788	11,001
0.20 Operating Costs	614	1,258	2,472	2,508	2,262	956	2,272	6,000	8,182	9,916
Operating Profit	-127	22	-201	-121	248	-197	40	-487	-395	1,085
Operating Costs times 3	Roughly equal to best of Europe, the French (double deck) at \$0.31 per passenger mile									
0.20 Revenues	487	1,280	2,271	2,387	2,510	759	2,312	5,513	7,788	11,001
0.30 Operating Costs	920	1,887	3,708	3,763	3,393	1,434	3,408	9,000	12,274	14,875
Operating Profit	-433	-607	-1,437	-1,375	-884	-675	-1,096	-3,487	-4,486	-3,873
Operating Costs times 4	Roughly equal to average of Europe and Japan, at \$0.44 per passenger mile									
0.20 Revenues	487	1,280	2,271	2,387	2,510	759	2,312	5,513	7,788	11,001
0.40 Operating Costs	1,227	2,516	4,944	5,017	4,524	1,912	4,543	12,000	16,365	19,833
Operating Profit	-740	-1,236	-2,673	-2,629	-2,015	-1,153	-2,232	-6,487	-8,577	-8,831