California High-Speed Rail Peer Review Group

Gary Gallegos | Stacey Mortensen | Lou Thompson
Chairman | Martin Wachs

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The Honorable Kevin de León
Senate President Pro Tem
State Capitol Building
Room 205
Sacramento, CA 95814

The Honorable Toni G. Atkins
Speaker of the Assembly
State Capitol Building
Room 219
Sacramento, CA 95814

The Honorable Jean Fuller
Senate Republican Leader
State Capitol Building
Room 305
Sacramento, CA 95814

The Honorable Chad Mayes
Assembly Republican Leader
State Capitol Building
Room 3104
Sacramento, CA 95813

Dear Honorable Members:

The California High-Speed Rail Peer Review Group is required by provisions of Proposition 1A (AB 3034) to provide comments on Business Plans developed by the California High-Speed Rail Authority. We have previously reported on Business Plans in 2009, 2012 and 2014. This letter reports our comments on the draft 2016 Business Plan.

The draft 2016 Business Plan is a marked departure from earlier Plans. It is the first Plan based on actual experience following the start of construction, and it shows how the Authority is learning from experience. It is also the first Plan in which the Authority is shaping its approach in accord with the funding it considers available rather than relying on unspecified sources. This shift from an "unconstrained" approach to a "constrained" approach lays out the Authority's assessment of what, given certain assumptions, they can deliver using existing funding sources.

In particular, shifting the Initial Operating Section (IOS) from one connecting Merced with the Los Angeles Basin as described in the 2012 and 2014 Business Plans to an IOS connecting a temporary station 20 miles north of Bakersfield with San Jose reflects the fact that the high costs of traversing the Tehachapi Mountains south of Bakersfield cannot be covered from identifiable sources of funding available in the short term. Under the constrained approach, the Authority is acknowledging that there are not sufficient existing funds to complete the southern leg, but is arguing that existing sources of funds are adequate to complete the specified northern segment. While it is understandable that costly segments of the project may need to be deferred until funds become available, and while early completion of less costly segments could in time encourage the closure of remaining costly gaps in the system, it should also be clearly acknowledged that inflation will increase the costs of these expensive segments in Year of Expenditure (YOE) dollars if necessary funds are not identified in a timely fashion.

The high-speed rail program has from its inception been a roadmap leading to partnerships. To complete its mission of transforming the California economy and landscape, the Authority must partner with many other public and private entities. Another important way in which the draft 2016 Business Plan differs from earlier ones is in the extent to which required partnerships have been initiated and are now in operation. Private construction contractors and California labor are at work on the project. The legislature has strengthened the partnership between California's HSR program and the state's leading greenhouse gas reduction programs, including local efforts as well as state-wide programs. Plans for blended operations and the upgrading of rights- of-way on which other agencies and railroads operate trains are progressively being implemented. Utilizing grants from the Authority, local governments and regional planning agencies are now engaged in land use and ground access planning, and a few cities are already building facilities that eventually will serve HSR passengers. The Peer Review Group takes note of this progress and urges that the work of partners be made more explicit in future business plans. For example, recognition of progress on ground access and land use planning in terminal areas should gradually play increased roles in land acquisition and in the timing and location of construction packages.

While the draft 2016 Business Plan reflects progress that has been made, it also serves to emphasize the important challenges and questions that remain for the Authority, for local governments and for the Legislature. A summary of our comments on the draft Plan, also incorporating conclusions in our letter to the Legislature of January 14, 2016, is that:

1. The new sequence adopting an IOS north to San Jose rather than south to the Los Angeles Basin was driven by financial limitations and leaves the gap in rail service from south to north unfilled until completion of Phase 1;

2. If the initial northern IOS is completed as planned, the lack of a connection into Bakersfield and the lack of a fully functional connection from San Jose to the Transbay Terminal in San Francisco will limit system ridership and passenger revenue: closing the gap should be a matter of priority;

3. The ability of the Authority to finance the IOS north to San Jose depends on assumptions about: (a) significantly lowered construction costs, (b) availability of Proposition 1A funding, (c) spending the full amount of federal American Recovery and Reinvestment Act (ARRA) funding; and, most important, (d) the authority's ability to securitize Cap and Trade (C&T) funding when needed in the future;

4. Completing the full Bakersfield to San Francisco link will depend on \$2.9 billion in new funding not currently identified, though the Authority suggests applying for Federal funds. The outcome of such an application is hard to predict; and

5. Despite demand, revenue and cash flow projections that are significantly more favorable than those included in the 2012 and 2014 Plans, completion of the Phase 1 system from Anaheim through Los Angeles Union Station to the Transbay Terminal in San Francisco continues to face roughly a \$19 billion gap in firmly established funding in the total \$55 billion cost even after projected private investment is included.

Given these issues, the Legislature could establish an adequate and stable funding stream for the Authority so that it could securitize some income streams such as C&T and extend availability payment guarantees to potential private sector partners. In addition, expansion of Federal participation in the form of RRIF or TIFIA loans also would need to identify reliable repayment mechanisms. Given the Legislature's continuous appropriation of C&T funds, the Authority's assumption may be reasonable for purposes of the draft Plan, but the ultimate validity of the assumption depends upon further Legislative action. Extending the C&T program beyond 2020 and defining the Authority's share of the proceeds is one potential way to achieve at least part of the funding objective, but other mechanisms also should be considered.

These conclusions are not intended as criticisms. The Authority is learning from experience and is employing state-of-the-art methods for demand and revenue forecasting and for risk prediction and management. The Authority has undertaken a massive project in an extremely litigious environment. The project is in its early days, and all forecasts should acknowledge considerable uncertainty and be interpreted with caution. The Authority's forecasts do so by using Monte Carlo simulations to set forth a range of possible outcomes. Some issues such as right-of-way acquisition, utility relocation and future tunneling in the Tehachapi Mountains are proving more difficult than expected and make final costs difficult to project.

The primary unresolved issue remains the assumptions, gaps and uncertainties in funding. The private sector Expressions of Interest (EOI) showed that risk-based private investment will not become available until demand has actually been demonstrated, leaving at least the gap in funding for the proposed initial IOS north to be filled by public sources. The gap is influencing the implementation of the project as the unexpected shift from south to north shows. In the Attachment to this letter, we discuss in more detail questions relating to system structure, the new business model including the potential role of private funding, revised capital costs, revised demand forecasts and how the Legislature may wish to respond to them in the year's activities.

The Authority asserts in the draft 2016 Business Plan that building a line connecting northern California to the Central Valley and commencing revenue service will position it to attract private investment and unlock additional capital to help complete the system. A review of experience with high speed rail systems in Europe and Asia shows that, after initial ramp-up, patronage tends to grow gradually over long periods of time even where established markets have existed for rail service prior to upgrading to high speed operations. In some cases the rate of development of markets caused actual financial returns to be lower than forecast. In

California, the intercity rail travel market remains limited and the initial IOS will not link the state's largest population centers. The Peer Review Group believes that, until the full linkage is established, the assertion that the IOS will unlock access to significant amounts of at-risk capital remains subject to uncertainty. Completion of the IOS and the initiation of operations will be an important milestone, but it will not reduce the importance of identifying a stream of public capital to undergird the possible investment of private capital in the foreseeable future.

We believe that the continuing uncertainty over the adequacy and stability of the funding for the project will make effective planning and management increasingly difficult. In this regard, we share the conclusions of the recent Legislative Analyst's Report[1] that the Legislature should consider taking action to ratify the Authority's plans for building the system, to clarify and stabilize its funding and to improve the Legislature's ability to oversee the project as it moves forward. On oversight, we raised a similar question in our January 14th letter "[l]ooking at the project as a whole and given its manifest importance to the State, is the current oversight adequate or should the Legislature create a focused committee along with a dedicated and adequately funded oversight staff lodged, for example, in the Legislative Analyst's Office?"

Please let me know if you have any questions about this report or if you would like to meet with members of the group to discuss the conclusions.

Sincerely,

Louis S. Thompson
Chairman, California High-Speed Rail Peer Review Group

cc: Hon. Jim Beall, Chair, Senate Transportation and Housing Committee
Hon. Anthony Canella, Vice Chair, Senate Transportation and Housing Committee
Hon. Jim Frazier, Chair, Assembly Transportation Committee
Hon. Katcho Achadjian, Vice Chair, Assembly Transportation Committee
Brian Kelly, Secretary, California State Transportation Agency
Mac Taylor, State Legislative Analyst
Ken Alex, Director, Governor's Office of Planning and Research
Dan Richard, Chair, California High-Speed Rail Authority
Jeff Morales, Chief Executive Officer, California High-Speed Rail Authority
Members, California High-Speed Rail Peer Review Group

[1] Legislative Analyst, "Review of High-Speed Rail Draft 2016 Business Plan," March 17, 2016, Summary page.

ATTACHMENT
Discussion of detailed issues

Issues of System Structure

The draft 2016 Business Plan lays out a three-stage approach to constructing the state's high-speed rail system. The first step would be to connect a temporary station at a point 20 miles north of Bakersfield through Merced and Fresno to San Jose. Including track, electrification, signaling, stations and rolling stock, the Authority asserts that this would constitute an initial operating segment (IOS) and would demonstrate actual demand. The Authority asserts that it can finance this section from existing sources.

A second step would extend the system into Bakersfield and would look to providing service through San Jose to the existing 4th and King Station in San Francisco. The third step would be the completion of Phase 1 by completing the connection to the Transbay Station and by extending service from Bakersfield through Burbank and the Los Angeles Union Station to Anaheim, initially using blended service south of Burbank that would be similar to the blended approach to providing service between San Jose and San Francisco.

This approach is a significant departure from earlier Plans that proposed extending the system south from Bakersfield first, with extensions to the north later. In our comments on the 2012 draft Business Plan, we urged the Authority to commit to either the IOS south or IOS north as soon as possible and we supported the Authority's ensuing decision in the final 2012 Business Plan to begin with the IOS south because it would close the most important remaining gap in passenger rail service in California. The draft 2016 Business Plan proposal to adopt the northern connection is explicitly driven by funding considerations and will leave the southern gap open for many years to come if added funding is not identified.

The second stage – service into Bakersfield and to San Francisco from San Jose – was not a separate part of earlier Plans and was again driven by funding considerations discussed below. We note several emerging issues that could cause funding and service problems in the San Jose to San Francisco section.

First, the draft plan leaves unclear how the required link from the existing Caltrain terminus at 4th and King Streets to the new Transbay Terminal will be completed. In part, this reflects the fact that the City's plans for completion of the link are not yet completed or funded, but the eventual performance of the project will be strengthened with full access to Transbay Terminal.

Second, presentations to the SamTrans Board acknowledge that Caltrain's long-planned Positive Train Control (PTC-compliant) signal system (CBOSS) faces cost and schedule overruns; these will have to be resolved by Caltrain well before initiation of high-speed service.[2]

Third, the project to electrify the blended system lines, partly funded by the Authority, may also be experiencing cost overruns and schedule delays, some of which are linked to delays in release

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[2] Caltrain staff presentation, "Communication Based Overlay Signal System Project Status," made to Board of Directors, February 4, 2016

of the Proposition 1A funding. Since these issues could affect the Authority's budget and quality of service, we recommend that the Legislature request a joint report from San Francisco city agencies, Caltrain and the Authority as to the status of these issues and how they can be resolved. This will be especially important if the proposed IOS north is implemented first.

The proposed completion of Phase 1 contains an added element – blended service from Burbank through Los Angeles Union Station to Anaheim – which is consistent with the PRG recommendations in our comments on the 2014 Business Plan. According to the Authority's demand modeling, a single seat connection from the Anaheim station would significantly increase demand for HSR and the distance from Anaheim to Los Angeles Union Station is short enough not to need high-speed service.

The Authority also proposes in the draft 2016 Business Plan a series of "concurrent investments," which are near-term projects, such as elimination of grade crossings and the run-through tracks at Los Angeles Union Station, that will have immediate benefits for current users but will also be needed when the high-speed service arrives. These improvements reflect the 2012 Memorandum of Understanding (MOU) between the Authority, SCAG, LA County Metro, Orange County Transportation Authority (OCTA), Riverside County Transportation Commission (RCTC), SANDAG, SANBAG, and Metrolink to identify and prioritize "a program of early investments in regional and local rail systems to facilitate the blended approach… regarding coordination of increasing interregional connectivity of the existing system (rail, bus, airports, and highways)."[3] We believe this will contribute to the growth of rail patronage in Southern California and will be useful for the state no matter how high-speed service plans evolve. It also leads to the establishment of a working relationship between the Authority and Southern California transportation agencies that will be beneficial when later and more complex elements of the program are undertaken.

Finance

The Authority states that it can finance the first step (20 miles north of Bakersfield to San Jose) as follows:[4]

Appropriated Funds	Amount ($ billions)
State Bonds (Prop 1A)	2.609
Federal Grants (ARRA/FY10)	3.165
Planning Funds	0.338
Committed Funds	
State Bonds (Prop 1A)	4.166
Cap and Trade (C&T)	5.341
Financing Proceeds	
Long-term Cap and Trade (2025-2050)	5.237
TOTAL SOURCES OF FUNDS	20.856
Construction Cost	20.680
Reserve	0.176

[3] Memorandum of Understanding (2012). Available at:
http://www.hsr.ca.gov/docs/brdmeetings/2012/April/brdmtg041212_MOU3120404.pdf
[4] Draft 2016 Business Plan, page 61.

This plan is based on a number of significant assumptions. First, it assumes that the litigation over Prop 1A funding will be resolved favorably and in a timely way; if there are no successful appeals of Judge Kenney's March 4th ruling, this assumption may eventually prove correct. Second, it assumes that all of the money available under ARRA will be spent before the September 30, 2017 deadline.[5] Third, the estimate of \$5.341 billion in C&T funding is based on an assumption as to the future money raised by the C&T program and the share of those funds that the Authority will receive. Either assumption could be incorrect, although it is possible that the amounts received could vary upward or downward from estimates. Fourth, and most important, the estimated \$5.237 in C&T Financing Proceeds is based on securitizing C&T funds expected to be received between 2025 and 2050. This may be feasible if (1) the C&T program survives legal challenges alleging that it is a tax that should have received 2/3 approval; (2) the C&T program is extended by law beyond 2020; and (3) the Authority's proceeds are guaranteed as to share and preferably as to absolute amount. Most of these assumptions are not under the control of the Authority, and addressing the issues related to C&T will require Legislative action.

The cost estimates for the completion of step 2, the extension into downtown Bakersfield and from San Jose to San Francisco, are also based on significant assumptions. It is assumed that \$2.9 billion will be found from an unidentified source of grant funding, though the Authority intends to seek federal support. It also is assumed that funding for the Transbay Terminal link on the part of the City of San Francisco will be found and that the project will proceed essentially as planned while service terminates in the interim at the 4th and King Station. Neither of the funding streams is under the control of the Authority and it is difficult to predict the outcome of applications for additional federal support.

There is an additional gap in funding for the full Phase 1 system.[6] If we assume that the project is completed through the full connection from Bakersfield to the existing 4th and King Station, the cost will be \$20.68 billion for the first step plus \$2.9 billion for the second step, for a total of \$23.58 billion funded by assumed existing funding plus an added \$2.9 billion from assumed federal (or other sources).[7] The total cost of Phase 1 is now estimated at \$55.295 billion,[8] leaving a gap of \$31.7 billion. The Authority's medium estimate of the net discounted cash flow the project might generate if the Phase 1 system is operated through 2060 is \$20.9 billion[9], with \$10.8 billion left to be funded (in addition to the amounts based on assumptions above), even if all demand, revenue and O&M cost assumptions (which we consider to subject to a wide range of uncertainty) should prove to be true.

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[5] The provisions of the ARRA funding require that any money not spent by September 30, 2017 must be returned to the U.S. Treasury. It is not "all or nothing": it only affects the amounts not spent.

[6] To be accurate, as noted in previous letters, this gap has persisted in various forms since the initiation of Proposition 1A. The law always looked to unidentified sources of funding (Federal, State, local governments, private sector) to make up the difference between the \$9 billion provided and the much larger total cost of the program.

[7] 2016 Draft Business Plan, page 61.

[8] Op cit, page 56.

[9] Op cit, page 64. This is the sum of the discounted cash flow generated through step 2 and the incremental discounted cash from completion of Phase 1. The comparable number for 8% is \$29.9 billion, which would nearly erase the gap as compared with the \$15.5 billion for 14%. These cash flow estimates do not appear to include the potential impact of taxes on a private investor. If taxes are due on positive cash flows (earnings), the value of the sums should be reduced accordingly.

Legislative action will be required to address the $5.2 billion in C&T securitization that cannot be completed under some interpretations of current law.[10] Another $2.9 billion will be needed, in assumed federal (or other) grants; and at least $10.8 billion more will be required to complete Phase 1 even if the Authority's net cash flow projections are fully realized – a total of $18.9 billion. The Legislature could close a part of this gap by extending the C&T program and guaranteeing the Authority's share. If the Authority were given the authority to pledge the full faith and credit of the state in making availability payments or in applying for RRIF or TIFIA funding, an added part of the gap could be closed. As we have stated in earlier letters, there are a number of potential tax measures, such as a tax on transportation fuels, sales or real estate taxes (which finance part of BART's needs), or various value capture measures at the state or local levels that could fully fill the gap if the state is committed to the program.

Business Model

The basic business model proposed in the draft 2016 Business Plan is for the Authority to manage and complete the construction under HSRA control and funding.[11] Operation of the initial IOS north would be managed by the Authority using a management contractor to demonstrate demand and grow revenues, whereupon there could be private capital available to invest in completing a concession for the entire system that the Authority's demand, revenue and cost forecasts argue will generate positive cash flow. Because of the decisions and commitments established by the work already done, and the requirements of Proposition 1A, this is probably the only available model, but it means that almost all technical and integration risks will remain with the Authority, unless they can be transferred to contractors. We emphasized this point in our letter of January 14, 2016. The model's viability also rests on projections we consider to be subject to a wide range of uncertainty (as measured by the Authority's Monte Carlo simulation work) that there will be a positive cash flow after operations commence large enough to support a significant investment from other potential partners.

A review of the responses (EOIs) from the private sector underlines another point that is addressed in the draft 2016 Business Plan – the need to get the skills and viewpoint of a potential operator into the Authority's decision-making process as soon as possible. We have emphasized this in many of our earlier letters and continue to urge the Authority to develop and implement a way to obtain an operator's inputs earlier than planned in prior Plans. For example, the Authority plans to initiate operations with a management contractor (similar to the approach of

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[10] This issue is discussed in the EOI response by Barclay's Bank. "No long-term stand-alone cap-and-trade financing is possible until ***four threshold issues*** are resolved:

• CARB and CHSRA must prevail against pending legal challenges to the cap-and-trade auctions and to the use of GGRF revenues for the high-speed rail project

• The Authority must create the "plumbing" in law to support borrowing against GGRF revenues

• The Legislature and CARB, respectively, must extend the cap-and-trade program in law and regulation beyond 2020

• The Legislature must protect the 25% of GGRF revenue flowing to the Authority from future impairment by the Legislature as long as financing obligations are outstanding.

See Barclay's response dated September 28, 2015, at pages 9 and 11.

[11] We note that the major share of actual engineering and construction management is being assumed by contractors, of which Parsons Brinckerhoff is the largest.

Caltrain and Metrolink) and later to shift to a more commercial, at-risk franchise after demand has been demonstrated. It might be possible to bring the management contractor in at a very early stage as an advisor and early operator without prejudicing the later ability to have a fully open competition for the eventual franchise.

While the Authority's business model lays out its plans for management of the construction project and discusses the administration of the initiation of operations, it does not fully detail the relationship between the Authority and eventual operator(s) as to how the rail passenger business is actually to be conducted. Who will set the fares, and on what basis? Will the operator be free to charge whatever maximizes cash flow (which would maximize any net income and thus capital contribution the operator might make) or will the operator be required to cap fares for ordinary passengers at some lower level (which would maximize public benefits but lower positive cash flow)? Who will control the "commuter" fares for shorter haul passengers? Who will oversee the safety of the system? Will the Authority's management contract and eventual concession serve to define its regulatory powers, and will the state let the Authority serve as the regulator, or will there be a separate regulator? These may appear to be distant issues, but they will eventually affect the value the state gets for its investment. While the details do not necessarily need to be settled immediately, we urge the Authority to provide more discussion in the final 2016 Business Plan so that the Legislature will be able to express its opinions on the policy aspects as soon as is feasible.

Changes in Capital Cost and in Demand/Cash Flow Forecasts

One notable aspect of the capital cost projections is the stability or even slight decrease (especially in cost/mile) in the capital cost estimates in the 2012 Plan and later. This permitted the addition in the draft 2016 Plan of a link to Anaheim while staying within the total dollar forecasts from prior Plans.

Another important aspect of the capital cost estimates is the shift within the total of costs from north to south. A technical document[12] indicates that the estimated capital costs of the Merced/San Jose and San Jose to San Francisco link fell from \$20.8 billion to \$13.0 billion (over 36%), while the estimated costs to complete from Merced to Los Angeles rose from \$33.1 billion to \$35.3 billion (6.6%). This estimate is based in part on the Authority's belief that lower bid costs and cost saving measures used in civil construction in the Central Valley will be carried over into the connection from Merced to San Jose as well as on a significant reduction in the costs associated with a revised and less costly design for the Diridon Station in San Jose and the Authority's assumed lower contribution to the costs of the extension to the Transbay Station. Without this shift, the initial IOS north, as proposed, would be significantly harder to finance within existing resources. The shift also highlights the facts that the Authority is not changing its estimates of the tunneling in the Tehachapi Mountains significantly (an increase of 17.6% from the comparable work in the 2014 Plan) and that its estimates of the cost of the link from Palmdale to Los Angeles have increased by only 0.1% from the 2014 Plan.

[12] See "Capital Cost Basis of Estimate Report, Draft 2016 Business Plan: Technical Supporting Document," pages 14 and 15.

We agree that the Authority's forecasts are based on appropriate techniques and best information available, including experience to date. In particular, the Authority's growing experience with value engineering and allowing contractors to suggest more cost effective approaches has been positive. But, we continue to believe that it is too early to have confidence in future capital cost, demand and net revenue forecasts. For example, the claims experience is not yet available for the first construction packages and, given the learning curve with ROW acquisition and costs, this could yet be significant. The cost of the extensive tunneling required in the Tehachapi Mountains has not yet been verified by actual bids and experience. Major uncertainties remain, including costs in the Los Angeles Basin (where the final routing is not yet fixed) and in the costs and potential delays in the link from San Jose to the Transbay Station in San Francisco, though some of these costs may eventually be borne by others.

As we have stated in prior letters, the Authority's demand and revenue analysis is technically sophisticated and their Monte Carlo simulations to quantify uncertainty are more advanced than those available for most major rail passenger projects. With this said, the changes made by the Authority in its demand forecasting (primarily related to use of later demand surveys for input into the demand model) yielded results that are favorable when compared with the 2014 and 2012 Business Plans. While this is certainly not bad news, it also serves to highlight the sensitivity of demand models to input data and the modelers' assumptions, especially when forecasts relate to entirely new service rather than to improvements in existing service. Even accepting the results of the new modeling, cash flow varies by more than a factor of 100% from low to high ridership projections[13], with the low estimate suggesting a very small ability of private investors to contribute to overall project investment.

As we have observed before, however, if the Legislature continues to support the project, the demand, revenue and cash flow forecast changes in the draft 2016 Business Plan do not affect any near-term decisions. The Authority will have to build, or not build, the initial part of the IOS north without any further knowledge of demand. The later decision to go south (at least as the 2016 BP shows) will be based on actual and demonstrated demand from the management contract operation from Bakersfield (or 20 miles north of Bakersfield) to San Jose (with connections to San Francisco via Caltrain). At this point, demand will be revealed and it will be the at-risk concession operator who will decide what demand forecasts to rely on in investing (or not) in the full Phase 1 system.

[13] See "High, Medium, Low Cash Flows, Draft 2016 Business Plan Technical Supporting Document," Exhibits 4, 5 and 6.