CALIFORNIA HIGH-SPEED RAIL
PEER REVIEW GROUP

January 3, 2012

The Honorable Darrell Steinberg
Senate President Pro Tem
State Capitol Building
Room 205
Sacramento, California 95814

The Honorable Bob Dutton
Senate Republican Leader
State Capitol Building
Room 305
Sacramento, California 95814

The Honorable John Perez
Speaker of the Assembly
State Capitol Building
Room 219
Sacramento, California 95814

The Honorable Connie Conway
Assembly Republican Leader
State Capitol Building
Room 3104
Sacramento, California 95814

This report is submitted to the Legislature by the California High-Speed Rail Peer Review Group pursuant to Section 185035 of the Public Utilities Code which provides in part:

- (a) The authority shall establish an independent peer review group for the purpose of reviewing the planning, engineering, financing, and other elements of the authority's plans and issuing an analysis of appropriateness and accuracy of the authority's assumptions and an analysis of the viability of the authority's financing plan, including the funding plan for each corridor required pursuant to subdivision (b) of Section 2704.08 of the Streets and Highways Code.
- (c) The peer review group shall evaluate the authority's funding plans and prepare its independent judgment as to the feasibility and reasonableness of the plans, appropriateness of assumptions, analyses, and estimates, and any other observations or evaluations it deems necessary.
- (e) The peer review group shall report its findings and conclusions to the Legislature no later than 60 days after receiving the plans.

The California High-Speed Rail Peer Review Group (Group) currently has 6 members (two appointments are open). To date, in addition to this review, we have issued four reports dealing with questions posed by the California High-Speed Rail Authority (CHSRA) or by Legislators and commenting on earlier Business Plans. We are concurrently commenting on the draft 2012 Business Plan issued by the CHSRA on November 1, 2011, and will issue our comments prior to the revised date for public input to that document. However, some of these comments are

included by reference in the discussion below as they furnish a more detailed analysis and background for the findings and conclusions in this document.

On November 3, 2011, the CHSRA's Board officially approved a "Funding Plan." This Plan constitutes the CHSRA's formal request for access to approximately $2.684 billion of Proposition 1A bonds to match $3.5 billion in Federal funding for purposes of construction of the first part of the eventual high-speed rail (HSR) system in California. The first step is called the "Initial Construction Section" (ICS) and consists of roughly 130 miles of high-quality track stretching from slightly north of Fresno to slightly north of Bakersfield. In turn, the ICS would form a key part of either of the proposed Initial Operating Sections (IOS), of which the IOS North would extend 290 miles from Bakersfield to San Jose or, alternatively, the IOS South would extend 300 miles from Merced to an entry point in the San Fernando Valley. Based on our understanding of Sec. 185035 (a), (c), and (e), the Group concludes that we are required to issue findings and conclusions on the Funding Plan as well as to provide comments on the draft 2012 Business Plan.

We are aware that there are a number of legal challenges to various aspects of the CHSRA's plans on definitional and environmental grounds. Since these issues will be decided in the courts, we will not comment further on them. Instead, we will address a number of issues that do fall within the "feasibility and reasonableness" rubric.

We also think it is unfortunate that the Funding Plan was certified simultaneously with issuing the draft 2012 Business Plan. Since both of these plans have a 60 day comment period, we are in the position of reaching findings and conclusions on the Funding Plan based upon the content of a foundational Business Plan document that is still in draft form. With a recent extension of the comment period, the Business Plan will not be in final form for a significant period of time after comments on the Funding Plan are due. Moreover, we note that there are a number of significant points in the draft 2012 Business Plan in which the content is materially qualified.[1] Nonetheless, we will offer some observations on the current version of the plan in this report, and intend to comment in more detail by the extended deadline.

FEASIBILITY

Phasing and Blending. The CHSRA is correct in concluding that a phased approach is the only feasible way to break the proposed HSR project into manageable components. The proposed phases: ICS, then IOS North or South (either of which includes the ICS), then Bay to Basin, then "single-seat" service from San Francisco to Anaheim using blended HSR/conventional operations from San Francisco to San Jose and Los Angeles to Anaheim, then the full Phase 1 build-out is a logical progression. We congratulate the CHSRA on its recognition of the viability of the blended option. Given the adamant environmental opposition

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[1] See, e.g.: "The Business Plan includes an *illustrative scenario* for use in projecting performance of the system. This illustrative scenario does not represent or suggest decisions by the California High-speed Rail CHSRA's Board or staff." (ES-8). "In accordance with the requirements of the funding plan, the Business Plan includes the analysis of scenarios that assume hypothetical annual funding levels and schedules. These scenarios are illustrative only and do not represent or suggest decisions made by the CHSRA's Board or staff, or by other stakeholders." (ES-11). "It is important to note that this project development schedule is illustrative and will depend on future decisions, the availability of funds, and other factors. The schedule does not represent or suggest decisions of the CHSRA's Board or other decision-makers; nor does it represent recommendations of the CHSRA staff."

to the full build-outs on either end of the system and the enormous added costs involved, we question the value of retaining the full Phase 1 build-out at all in any of the CHSRA's more immediate plans. If the time comes, many years in the future, when the capacity of the blended system(s) is inadequate to meet demand, that will be the time to re-consider the need for added tracks in these sensitive urban areas. We are also concerned with the indecision as to whether IOS South or IOS North will be the first operational segment to be completed. Although the draft 2012 Business Plan makes the performance in cost and operations of the two segments look quite similar, it is hard to seriously consider a multi-billion dollar Funding Plan that offers no position on which IOS should be initiated first. This indecision may also have consequences in obtaining environmental clearances. We believe that the Funding Plan as proposed should not be approved until the first IOS is selected.

The ICS/IOS Distinction. The CHSRA has created a difficult dilemma in the ICS/IOS distinction. The ICS was defined in discussions with the U.S. Federal Railroad Administration. The ostensible justification – construction in the Central Valley would be cheaper and less subject to environmental opposition and would permit an initial high-speed test and demonstration track – has subsequently come under considerable question. Further, the ICS as planned is not a very high-speed railway (VHSR), as it lacks electrification, a VHSR train control system, and a VHSR compatible communication system. Therefore, it does not appear to meet the requirements of the enabling State legislation. The only clear remaining basis for the ICS is that it can serve as a vehicle for the use of Federal money that has specific deadlines. Although the ICS is a basic component of either IOS (and the ultimate system), it has no independent utility other than as a possible temporary re-routing of the Amtrak-operated San Joaquin service during the time period after the ICS is available but before an IOS is opened.[2] Further, the ICS will not be electrified, and thus cannot serve as a high-speed test track for future VHSR rolling stock.[3]

Even if we optimistically assume that the ICS can be completed within the $6 billion cost estimate, the CHSRA has been very honest in making it clear that they do not have the additional $25 to $30 billion needed to complete either of the Initial Operating Segments, and there are no existing funding sources at any level of government that could credibly fill the gap. There is no HSR funding in the Federal FY 2012 budget, and CHSRA admits that committed Federal funding for the period of 2015 to 2021 is not fully identified.

An attempt to draw an analogy to the construction of the interstate highway system or the national air space system, (airports, etc.), may work from a phasing perspective, but these programs were supported by authorizing legislation that had a dedicated funding source primarily dependent upon user fees; that is, a Federal excise tax on motor fuel for the Highway Trust Fund and passenger and airline excise taxes for the Airport Improvement Fund. The HSR system, either in California or nationally, has no such dedicated funding source. The current HSR and passenger rail programs are funded through annual Federal appropriations from the

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[2] Note that Amtrak's revenues do not cover its costs, and it receives financial support from the State and the Federal government to cover its operating losses. In accord with PRIIA requirements, the operating losses of the San Joaquin service will become wholly the responsibility of the State.

[3] The Association of American Railroads operates a high-speed (165 mph), electrified test track at its Transportation Test Center facility in Pueblo, CO. This was used to test both the AEM-7 locomotives and the Acela train sets before use by Amtrak in the Northeast Corridor.

General Fund making such funding uncertain for an indefinite period, especially in the face of large and continuing Federal deficits.

The fact that the Funding Plan fails to identify any long term funding commitments is a fundamental flaw in the program. Without committed funds, a mega-project of this nature could be forced to halt construction for many years before additional funding could be obtained. The benefits of any independent utility proposed by the current Business Plan would be very limited versus the cost and the impact on the State's finances. The CHSRA has also made it clear there will be no private sector interest in the project until the full public role is defined and funded, which means that significant private funding will not be available for many years. Moreover, we are not optimistic that this situation will change in the foreseeable future. The Legislature could, of course, rectify this by enacting a dedicated fuel tax or some other form of added user charge that would not aggravate the existing State budget deficit. Lacking this, the project as it is currently planned is not financially "feasible."

Incomplete Business Model. In our previous reports, we have urged the CHSRA to develop a business model -- that is, a statement of the roles and responsibilities that each of the parties will be expected to assume. In response, the draft 2012 Business Plan describes in general terms a business model in which the CHSRA would design and build the infrastructure and design and order the rolling stock for one of the Initial Operating Segments, then award a management contract for the IOS to an operator. At this point, all investment and operating risk (including demand and revenue) would still be retained by the CHSRA. Optimistically assuming that the IOS would generate an operating surplus, the CHSRA would hope to convert the operating contract into a gross or net-cost concession[4] in which the concessionaire would assume some part of the operating cost and demand and revenue risk. If the operating surplus is great enough, the concessionaire would assume some of the final investment risk in the Bay to Basin and Phase 1 infrastructure and rolling stock, and possibly even some of the revenue risk.

While we applaud the CHSRA for beginning to think about this critical issue, we do not think that the current description constitutes a "feasible" business model for a number of reasons.

First, the draft 2012 Business Plan lays out what is explicitly termed an "illustrative" concept that "does not represent or suggest decisions of the CHSRA's Board or other decision-makers ... nor does it represent recommendations of the CHSRA staff." Without these decisions, we have no basis for a finding.

Second, the model would have the CHSRA in full control of design, construction, and funding through at least the first IOS, and the CHSRA would probably retain a major investment and management role through completion of the full Phase 1 stage. As discussed above, the CHSRA has not identified the funding source for this approach, so the business model is not consistent with the available funding.

Third, despite the CHSRA's own statement that "...the largest cost and delay risk comes from system integration" (5-10), the CHSRA appears to be proposing an approach that would

[4] In a gross cost concession, the public owner usually sets fares and takes demand and cost risk whereas in a net-cost concession, the concessionaire makes demand projections, sets fares (within regulated limits) and takes at least some demand risk.

exclude the operator from an effective role in the design of track, signals and rolling stock where the critical integration issues will be decided. In doing so, the CHSRA will inherently be making decisions that affect the eventual success of the system that are best left to the operator and will be assuming design liability issues that it is not well-suited to carry.[5] Without input from the final private sector participant regarding route alignment and station location, the future value of the HSR concession/franchise may be greatly diminished and less attractive to potential private sector participants. In other words, the private sector needs to be brought into the process much sooner than currently planned.

Inadequate Management Resources. We have repeatedly said that we do not believe that the current approach to project management, with the CHSRA's staffing, salaries, and procurement controlled by California public agency rules, will suffice if the project gets fully underway and the CHSRA suddenly has to manage a construction effort that is larger than that currently managed by Caltrans. The draft 2012 Business Plan does not address this issue except to note that the CHSRA has vacant positions. We urge the CHSRA and the Legislature to address this issue immediately because, if construction gets underway, the very predictable shortcomings in project oversight will be much harder to address and will be very costly to resolve.

REASONABLENESS

Demand Forecasts. Demand forecasts are at the heart of the eventual success of the system. If the forecasts are too optimistic, the first IOS may not operate at a surplus and the legal ability of the CHSRA to proceed could be called into question. More broadly, the demand forecasts underpin the benefit/cost analyses and the estimates of avoided investment on which the public justification of the system is based.

The demand forecasts have been developed and peer-reviewed by reputable professionals. After seeing the forecasted demand rise steadily from the 2000 Business Plan through the 2008 and 2009 Business Plans, the draft 2012 Business Plan may be taking a somewhat more realistic approach, with generally lower forecasts and with a range of demand employed in "low," "medium" and "high" scenarios, though there is no apparent quantitative basis for the range of estimates provided. Unfortunately, despite a strong recommendation from this group, the demand forecasts remain an internal product of the CHSRA and its internal peer review panel. The forecasts have not been subjected to external and public review, and many of the internal workings of the model, especially as applied to the IOS and Bay to Basin scenarios, remain unclear. Absent such an open examination, which could easily be provided before the final Business Plan is published, we cannot characterize the demand forecasts as reasonable – they are simply unverifiable from our point of view.

Capital Costs. Capital cost estimates for the system have been steadily rising in every Business Plan. The driving forces – growing knowledge of the problems and the challenges facing the system, the addition of expensive tunnels and viaducts to alleviate environmental objections, rising real estate costs, and inflation, among many others – are inherent to mega-projects. If the experience of the Group's members is a guide, many of the problems

[5] This is directly in conflict with our earlier recommendation that the CHSRA quotes in full. (footnote 2, 5-18).

have not been fully identified, much less controlled, at the 15 to 30 percent design level of this project.

The capital cost of either the IOS North or IOS South is projected in a range of $84.8 million/mile to $109.3 million/mile in 2010 dollars. To be sure, these are more realistic numbers compared to previous estimates, but they were still based upon the draft 15 percent design work. We would note that the cost to build a light rail system in an urban area is roughly $100 million/mile, and the tighter specifications and much higher power requirements for HSR will certainly increase the cost over light rail. This is compounded by the fact that a number of final route decisions have not been made or are still subject to change. Further, potential environmental litigation may delay parts of the project for a considerable time, and unpredictable funding may also slow, or even halt, planned work.

More important, we note that the cost component of the project that may have the most inherent uncertainty – the ICS – has no low or high scenario, and is shown as a constant $6.0 billion. Given that there has been no construction experience at all, and considering the fact that the route is not yet fully defined, this appears unreasonable in itself. As a result, the conventional approach of multiple contingencies plus adding "fat" to the schedule may not be appropriate. The reasonableness of the capital budgets would be improved by development of a risk-based, cost-loaded construction schedule that makes a more explicit attempt to allow for a broad range of outcomes in cost and schedule.

Risk Minimization. As discussed in earlier correspondence and in reports by the Legislative Analyst's Office (LAO), the decision to put the entire initial effort into the Central Valley maximizes the risk to the State if no significant funding appears after the initial Federal contributions. This is because the San Joaquin passenger rail service carries about 1 million passengers annually, whereas the two end segments – San Jose to San Francisco, and Los Angeles to Anaheim – support service to nearly 28 million passengers annually. Some improvements on the two end segments will be necessary for the blended approach (electrification and minor track changes for the Caltrain services, grade crossings, and other track changes for Anaheim to the San Fernando Valley) in any case, and would reduce the risk to the state of a stranded project. In addition, both Caltrain and Metrolink have experienced management teams who could administer their segments effectively, relieving the CHSRA of a portion of the management burden which, we believe, CHSRA cannot handle under the current organizational approach.

Appropriateness of Assumptions, Analyses, and Estimates[6]. In our judgment, a finding of feasibility of the Funding Plan would require that the following assumptions be found reasonable:

- That the ICS can be completed within the budget allotted and within the Federal time frame for completion by September 30, 2017. We regard this with concern because of a lack of actual construction experience, a lack of managerial resources, and the potential delays associated with environmental litigation.
- That the added $24 to $30 billion to finish the first IOS will somehow be found. Since the only source under the Legislature's control would be the State Budget, we must

[6] Estimates in 2010 dollars.

then assume that some source of funding will be found if new Federal programs are unavailable.[7]

- That the cost of the first IOS will be close to budget, that the actual demand will be close to projections, that the CHSRA can successfully manage all the issues of system integration without the input of an involved private sector operator, and that the contracted operator will earn a significant profit from year one.
- That the same assumptions, along with an added $14 billion to $17 billion, will be valid for the second IOS, with similar assumptions and added funding for Bay to Basin ($14 to $18 billion) and Phase 1 blended (another $14 to 18 billion) or the full Phase 1 (an additional $8 to $10 billion).

All of these assumptions may be conceivable, but our experience with the Northeast Corridor, HS1 and HSR in Korea, and our professional knowledge of the overall European HSR experience, strongly suggest that each of these assumptions alone is at least slightly optimistic and, taken together, strongly so.

CONCLUSION

In this report, we have discussed a number of considerations under which the Funding Plan and the Business Plan can be improved. Some of these suggestions can also reduce project risk and improve financial feasibility. We do not discuss a number of additional comments on the draft 2012 Business Plan that have less bearing on the feasibility of the project or the reasonableness of going ahead. With this said, we cannot overemphasize the fact that moving ahead on the HSR project without credible sources of adequate funding, without a definitive business model, without a strategy to maximize the independent utility and value to the State, and without the appropriate management resources, represents an immense financial risk on the part of the State of California.

Until a final version of the 2010 Business Plan is received, we cannot make a final judgment on the Funding Plan. Therefore, pending review of the final Business Plan and absent a clearer picture of where future funding is going to come from, the Peer Review Group cannot at this time recommend that the Legislature approve the appropriation of bond proceeds for this project.

If you should have questions regarding the Group's comments, please do not hesitate to contact me.

Sincerely,

Will Kempton
Chairman
California High-Speed Rail Peer Review Group

[7] We note, also, that the Authority would not really be able to wait five years to determine whether to go ahead with an IOS. The ICS will peak in 2-4 years after which the need for a go-ahead decision on further work will become urgent.

c: Hon. Bob Huff, Senate Republican-Elect Leader
Hon. Mark DeSaulnier, Chair, Senate Transportation and Housing Committee
Hon. Ted Gaines, Vice Chair, Senate Transportation and Housing Committee
Hon. Alan Lowenthal, Chair, Senate Select Committee on High Speed Rail
Hon. Bonnie Lowenthal, Chair, Assembly Transportation Committee
Hon. Kevin Jeffries, Vice Chair, Assembly Transportation Committee
Hon. Cathleen Galgiani, Chair, Assembly Select Committee on High-Speed Rail for California
Hon. Bill Lockyer, State Treasurer
Hon. John Chiang, State Controller
Mac Taylor, State Legislative Analyst
Ken Alex, Director, Governor's Office of Planning and Research
Ana Matosantos, Director, Department of Finance
Traci Stevens, Acting Secretary, Business Transportation and Housing Agency
Tom Umberg, Chair, California High Speed Rail Authority
Members, California High Speed Rail Authority
Roelef van Ark, Chief Executive Officer, California High Speed Rail Authority
Members, California High Speed Rail Peer Review Group