November 18, 2010

The Honorable John Perez
Speaker of the Assembly
State Capitol
P.O. Box 94849
Sacramento, California 94249-0046

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

Dear Speaker Perez and Senate Pro Temp Steinberg:

Please find attached the California High-Speed Rail Peer Review Group's (Group) summary comments on the California High-Speed Rail Authority's (Authority) 2009 Report to the Legislature (Attachment A). Also please find the Group's full comments (Attachment B) in which all members concur.

The Group appreciates the challenge the state faces in planning and managing a project of such immense complexity and long-time horizon. This is especially true in the current policy climate of budget shortfalls, limitations on spending, and uncertainty as to future federal and state policies and capabilities. It would be a daunting task under the best of circumstances. Meeting the challenge will require a thorough re-assessment of a number of critical engineering, financial, economic, and managerial issues, and will require agreement among the Legislature, the Governor, and the Authority on what the resolution of those issues should be.

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

WK:be

c: Hon. Bob Dutton, Senate Republican Leader
Hon. Connie Conway, Assembly Republican Leader
Hon. Alan Lowenthal, Chair, Senate Transportation and Housing Committee
Hon. Bob Huff, Vice Chair, Senate Transportation and Housing Committee
Hon. Bonnie Lowenthal, Chair, Assembly Transportation Committee
Hon. Kevin Jefferies, Vice Chair, Assembly Transportation Committee
Hon. Curt Pringle, Chair, California High-Speed Rail Authority
Roelef van Ark, Chief Executive Officer, California High-Speed Rail Authority
Members, California High-Speed Rail Authority Peer Review Group

California High Speed Rail Peer Review Group Summary Comments on the California High Speed Rail Authority's 2009 Report to the Legislature

Attachment A

Below are the summary comments by the peer review group on issues as they appear in the High Speed Rail Authority's 2009 Report to the Legislature and other related documents reviewed by the group.

Authority Staffing. Though not an explicit part of the 2009 Business Plan, we are concerned after discussions with the Authority that the staff level now permitted is totally inadequate to oversee a project of this magnitude, no matter what business model is ultimately chosen. One of the dangers in public sector management of major projects is that staffing levels and compensation are not always related to the needs of the job at hand because of bureaucratic restrictions. The existing massive imbalance between the numbers of Authority staff and consultants has been the source of continuing criticism; the problem will be much exacerbated as the project moves into implementation. We urge the Authority, the Governor and the Legislature to ensure that the Authority has access to the staff numbers and compensation needed for managing the project: anything less will ensure major problems of budget control, accountability and schedule. In addition, we suggest that the Authority and Legislature consider other organizational approaches, such as public corporations, that would improve the ability of management to secure adequate staff and reliable funding.

Business Model. The Authority should focus immediately on selection of an appropriate "business model." "business plans," "strategic plans" and "business models" are not synonymous. The business model must be a clear statement by the Authority of the roles to be played by all involved parties concerning the project's ownership, construction, financing and general management. As the project moves toward implementation, the selection of an appropriate business model, though a complex task, will have great bearing on the project's implementation and success.

There appear to be five general business models that might be used in California, though there are many variations due to local conditions. (1) **Fully public, mass transit model**: using BART as an example, the Authority would acquire all needed property, manage and pay for the design and construction of the system, acquire rolling stock, set fares and manage the operation and maintenance of the system; (2) **management contracting, or "gross cost" franchising/concessioning**: the Authority would plan, finance and build the project according to the Authority's demand estimates, but contract with a private entity to take responsibility for operating and maintaining it at the Authority's specified demand level; (3) **long term "net cost " concessioning**: the Authority would plan and construct the system, and concessionaires would then compete for a long term contract under which they would set prices and make demand estimates, furnish rolling stock and operate and maintain the system; (4) **separated infrastructure**: the Authority would design, finance and construct the system and permit one or more operators to provide rolling stock and operate various services, and the Authority would charge non-discriminatory access fees to all operators, including the HSR operator(s) and other local service providers; (5) **essentially private approach**: the Authority would acquire right-of-way (ROW), establish a broad system of specifications and award an exclusive concession to a private consortium to design, build, finance, operate and maintain the system based on a long term contract. As the project moves toward

implementation, the model chosen by the Authority should be based on available project finances, private and public costs and benefits, and risk sharing.

Management of Risk and Uncertainty. All "mega projects" such as High Speed Rail (HSR) carry significant risk and uncertainty. Community opposition to the project's proposed alignment between San Francisco and San Jose, as well as the early stage of the system's overall design status (among many other issues) will cause the cost of the project to fluctuate.

Further contributing to the project's uncertainty will be the expected change in the estimated cost variability in each of the project's components. The Authority should make the necessary adjustments in these areas based on the project's stage of development. By doing so, the Authority will provide the public a better understanding of the reliability and variability of the engineer's estimate. Applying traditional mechanisms to the engineer's cost estimate, such as percentage contingencies, etc., will not engender continued confidence in the project. In addition, we encourage the Authority to conduct more detailed and transparent sensitivity analyses of the impact on expected outcomes of variations in demand, revenues, investment costs, operating costs and project timing.

The transfer and allocation of risk is another issue which the Authority needs to assess. In the context of the business model, the Authority should investigate project risks and determine who will bear them along with a justification of why a particular risk allocation model was selected.

The Financial Gap between Currently Available Resources and Total Project Cost. There is now considerable uncertainty and unreliability of federal funding combined with the state's structural deficit, over-reliance on federal funding and budget unpredictability. In light of the public concern over excessive government spending, how will the Authority close the gap between any funding resources and the project's total estimated cost? What will the Authority's course of action be if the funding gap cannot be closed? The group suggests that if the project experiences a shortage of funding resources, it should: (1) concentrate the funds available on completing operable segments; and (2) reassess the business model, given the ability and willingness of the involved parties to raise money. The group has two added concerns related to the operable segment issue and the absence of a credible financial plan. The Authority apparently must now focus federal resources on a single segment, requiring a choice between demonstrating HSR in the short run and independent utility if the project is not completed.

The lack of a clear financial plan is a critical concern. The group fully realizes that developing a credible financial plan is difficult depending, as it does, on a large number of decisions not yet made and on factors far beyond the control of the Authority. In a deteriorating budget climate in which even large and highly beneficial projects are abruptly canceled because of shortage of funds, and in which the likelihood of new large federal funding programs appears small, there is an air of unreality about a plan that includes $17 to $19 billion in "free" federal funding from programs that do not yet exist. The same can be said of the expectation for large local or state funding for stations and area development, when local governments are highly stressed and when the finances of the state are sufficiently weak that a sale of $9 billion in state General Obligation bonds might only be possible (if at all) at unusually high interest rates. This limits the project's credibility with private investors. The demonstration of firm Public Sector financial commitments will be an absolute necessity, prior to approaching sources of private capital. In our discussion with Roelof van Ark, it is clear that the Authority recognizes the

"chicken and egg" nature of the conundrum: the Authority cannot get private investment without a solid prospect that the project will be completed and it cannot complete the project without private investment that would make the project successful.

Demand Modeling and Estimating. The Authority has come under increasing criticism regarding the project's demand and revenue estimates. The issues identified by the Institute for Transportation Studies at the University of California at Berkeley, the Legislative Analyst's Office and the State Auditor's office have raised sufficient concerns with the demand model so as to call into question the project's fundamental basis for going forward. The group recommends that the Authority work with UC Berkeley, the Legislative Analyst's Office and the State Auditor to complete an analysis of any issues regarding the demand models so that a mutually agreed estimate can be reached along with ranges of uncertainty. Failure to arrive at such an agreement will put the project's forward progress in jeopardy.

Need for a Revenue or Demand Guarantee. According to the Proposition 1A bond measure, any public "operating subsidy" is prohibited, making demand or revenue guarantees legally questionable. However, discussion of a revenue or demand guarantee for the private sector in order to attract private investment must be seen in the context of the business model adopted by the Authority. For example, if a private concession were offered to an operator whereby the operator was required to design, build, finance, and operate the system as well as buy rolling stock, much of the demand risk might have to be assumed by the Authority through a revenue guarantee unless the demand estimates were pegged so high that the profitability of the system was beyond a doubt. Conversely, if the system were designed and built by the Authority, with the Authority buying and leasing the rolling stock and not charging the operator for the use of the system, with operator's revenues applied to covering only the operation and maintenance costs, the need for a demand guarantee and subsidy might well not arise.

Obtaining an agreed definition of the term "operating subsidy" has become critical. A recent report, "The Financial Risks of California's Proposed High-Speed Rail Project," has argued that interest payments on State bonds should be considered as a part of operating costs, whereas the Authority has excluded State bond interest (and most other capital costs) from funds to be repaid by the Authority. The Authority should seek clarification on the costs and revenues to be included within the term "operating subsidy." This could significantly affect the legal viability of the project and the choice of business model.

The "Financial Risks" study highlights the confusion between **financial** analysis, the basis for private involvement, and **economic** analysis, the basis for public involvement. The study makes a series of critical comments on the 2009 Business Plan and deserves careful attention and response from the Authority, as we share many of the same concerns. The study is, however, limited to financial analysis, while leaving aside all of the reasons – consumer surplus, reduction of congestion on rural and urban highways, airports and airways, reduction of pollution and carbon emissions, and reduction of accident costs, among others – that would be included in an economic analysis to evaluate public involvement in the project. The treatment of public benefits was much more detailed in the 2008 Business Plan than in the 2009 Business Plan. Given the importance of the issue in the overall evaluation of the project, and the close interrelation of public benefits with demand forecasts, we strongly encourage the Authority to include a thorough and updated treatment of public benefits and costs in the 2010 Business Plan and to link these results with the agreed definition of "operating subsidy."

ROW and Alignment Availability. While different types of service can run on the same right of way, the Review Group agrees that freight and high speed rail should not operate on the same track. There remains significant uncertainty in the cost and the availability of ROW as well as alignment issues. While we understand that the level of cooperation has improved, any lack of cooperation, or resistance by Class I Railroads regarding the joint use of urban rail segments as well as the project's need for long and straight alignments, will be problematic. The Authority should recognize the risks involved and the impacts they will have on budgets and project schedules. The Authority must be prepared to finalize an alignment as well as develop an approach which acknowledges the potential of any alignment changes and the risks involved in order to minimize their impact on the project.

Technical, Safety and Seismic Issues. There has been limited information from the Authority regarding such issues as what proportion of the project will be at-grade, in tunnel and/or elevated. These decisions will have significant cost implications. For example, analysis of the cost of the high speed rail project in China revealed that the cost of elevated track was approximately double the cost for at-grade track and the cost of tunnels was double the cost of an elevated configuration. Any decisions made by the Authority in this area will have significant financial implications for the project. The same can be said of train speeds and seismic-related issues. Specifically, train speeds in China, due to safety reasons, mandated that the track be grade separated, either in tunnel or elevated. Also, given the seismic issues in California, larger foundations will be needed, resulting in higher system costs, perhaps by as much as 60 percent. The Authority needs to make a clear statement on these issues.

DETAILED COMMENTS FROM THE PEER REVIEW GROUP
Attachment B

California Law AB 3034 required that a peer review group be established "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." AB 3034 states the duties of the peer review group as follows: " "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."
No later than 90 days prior to the submittal to the Legislature and the Governor of the initial request for appropriation of proceeds of bonds authorized by the chapter for any eligible capital costs on each corridor, or usable segment thereof, identified in subdivision (b) of Section 2704.04, other than costs described in subdivision (g), the authority shall have approved and submitted to the Director of finance, the peer review group established pursuant to Section 185030 of the Public Utilities Code, and the policy committees with jurisdiction over transportation matters and the fiscal committees in both houses of the Legislature, a detailed funding plan for that corridor or a usable segment thereof.
The peer review group is required to "report its findings and conclusions to the Legislature no later than 60 days after receiving the plans."

AB 3034 established an 8 member group appointed as follows: two individuals with experience in the construction or operation of high-speed trains in Europe, Asia, or both, designated by the Treasurer; two individuals, one with experience in engineering and construction of high-speed trains and one with experience in project finance, designated by the Controller; one representative from a financial services or financial consulting firm who shall not have been a contractor or subcontractor of the authority for the previous three years, designated by the Director of Finance; one representative with experience in environmental planning, designated by the Secretary of Business, Transportation and Housing; and two expert representatives from agencies providing intercity or commuter passenger trains services in California, designated by the Secretary of Business, Transportation and Housing.

The group currently has six members, including: Walter Bell (appointment by the Treasurer); John Chalker (appointment by the Director of Finance), Diane Eidam (appointment by the Controller), Will Kempton (appointment by the Secretary of Business, Transportation and Housing), Lou Thompson (appointment by the Secretary of Business, Transportation and Housing) and Frieder Seible

(appointment by the Treasurer).[1] Will Kempton has been elected Chairman of the group and John Chalker has been elected Vice Chairman.

The group members first convened on June 17, 2010 to discuss how the work of the group will proceed. Members of the group had met on previous occasions but, lacking a quorum, reached no specific result. In addition, members of the group were asked by the Authority to comment on a consultant's study[2] dealing with organizational issues including the Chief Executive post that has now been filled. Subsequently, the group has convened by phone on July 27, August 25 and September 29th and was briefed on the status of the project by Roelof van Ark on October 1, 2010. The group convened in San Diego on October 27. This communication summarizes the results of all discussions and meetings.

As yet, no requests to use bond funds have been referred to us. We are, however, aware of the Senate Budget Subcommittee hearing that took place on May 24, 2010 concerning the future role and responsibilities of the group.[3]

We have also reviewed a number of reports and documents, including: the Authority's 2008 and 2009 Business Plans; the Legislative Analyst's Office (LAO) 2008 and 2009 analyses of the Business Plans; the California State Auditor's April 29, 2010 report (Report 2009-16) on the status of the project; the Authority's Addendum to the Authority's "Report to the Legislature; December 2009" (adopted April 8, 2010) concerning changes to be made to the 2009 Business plan and responses to comments that had been received on the plan; a memorandum dated March 3, 2010 from then Executive Director Mehdi Morshed to Authority Chairman Pringle entitled "Recent questions about ridership and revenue forecasts;" the University of California at Berkeley's review of the Authority's demand forecasting; a report "The Financial Risks of California's High-Speed Rail Project;" and, the Inspector General's letter report dated October 27, 2010. In addition, some members of the group have, with permission of the Authority, contacted the Authority's consultants for clarification or additional information.

Based on these documents, we have decided that there may be value in a communication from the group. We would like to provide guidance to the Authority on the issues that the group will consider important when evaluating future Business Plans and when we do comment on requests for approval of plans for funding. Finally, this communication responds to the apparent desire of the Senate to have the group meet by August 1, and submit a report to the Legislature by January 1, 2011.

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[1] An additional group member, Eugene Skoropowski was appointed in early 2009 and subsequently resigned in late 2009.

[2] KPMG Organizational Assessment.

[3] See "Hearing Outcomes, Senate Budget and Fiscal review, Subcommittee No. 2, May 24, 2010.

Many of the issues discussed below are identified in the LAO and Auditor's report, though we may approach them from a different point of view. We believe that the appointment of the Chief Executive (Roelof van Ark) and a rapidly growing Authority staff will mean that the Authority will soon need to confront critical issues that have been postponed pending the appointment of the Chief Executive. The issues are: Authority staffing; the Authority's business model for HSR; management of risk and uncertainty; the financial gap between required and available resources; demand modeling and estimating; the need for a revenue guarantee and the prohibition against operating subsidies; right-of-way (ROW) availability issues, especially the use of the Union Pacific ROW in the San Francisco Bay Area; and technical, safety and seismic issues.

Authority Staffing Issues

Though not explicitly addressed as a part of the 2009 Business Plan, we are concerned after discussions with the Authority that the staff level now permitted is totally inadequate to oversee a project of this magnitude, no matter what business model is ultimately chosen. In fact, one of the dangers in public sector management of major projects like High Speed Rail (HSR) is that staffing levels and compensation may not be related to the needs of the job at hand because of unrelated funding or bureaucratic limitations. The massive imbalance between Authority staff and consultants has been a legitimate source of continuing criticism; the problem will be much exacerbated as the project moves into implementation. The future risks in terms of cost control and accountability are very high, and every adverse experience will further decrease the project's credibility at a time when the public seems increasingly concerned about the capability and accountability of government. We believe that a number of the auditing difficulties reported by the Inspector General are the result of this problem. We strongly urge the Authority, the Governor and the Legislature to ensure that the Authority has access to the staff numbers and compensation needed for managing the project. Anything less will ensure major problems of budget management, cost control, project accountability and schedule slippage.

The continuing staffing problem raises a much broader issue that we believe deserves serious consideration: is it appropriate to continue to try to manage this project within the state government framework? It is, of course, possible to plan and effectively manage large construction projects within the California state bureaucracy. The HSR project is, however, a much broader and more demanding undertaking even than major highway and bridge projects now underway. The HSR project will be the largest ever undertaken in the state. It will span many years over which it will need reliable funding not subject to year-to-year budgetary vicissitudes. It will have a very large amount of private sector investment and management. Perhaps most important, the ultimate result will probably be some form of a Public Private Partnership (PPP) based business entity, not just a public agency. Depending on the business model chosen (see discussion below), the project will need unfettered access to a large number of

professionals at levels and with skills far different than those normally needed in the public sector. There are precedents for publicly owned corporations (Amtrak is an example) that provide a much better balance of accountability to the public interest and the flexibility to plan and manage in a commercial way than the public agency format in which the Authority is now mired. We urge the Authority and Legislature to consider the options available for more effective management.

The Business Model for HSR

Although we will discuss a number of points below where we agree with comments submitted by the LAO or the State Auditor, we believe that the proposed business model for the HSR project has not received enough attention and yet is probably the critical organizing principle around which most issues will need to be resolved. By "business model" we do not mean "Business Plans" or "Strategic Plans," or other reports by the Authority. Rather, we view the business model as a clear statement of the Authority's intentions as to the roles to be played by each of the parties in owning, constructing, financing and managing HSR in California. Thus far, the Authority's reports have discussed some of the options for a business model, but are lacking in the decisions that will be needed to establish the actual business model to be deployed.

In fairness to the Authority, it would have been premature to make these decisions prior to the implementation phase of the project. The Authority itself has recognized, however, that the project now has to move beyond planning and promotion to implementation and that will require that the business model for implementation be selected.

Selecting the business model may be the most difficult of the decisions the Authority now faces. Though high-speed railways are technically complex, there is little or nothing in the technology that is seriously stretched by the Authority's plans. Definition of routes and evaluation of environmental options is also a challenge, but no more so than California already faces on many major highway and airport projects. The sheer scale of the project is an issue, but "mega-projects" are increasingly common and the issues are reasonably well understood, though on-the-ground experience suggests caution in believing that results will be identical to projections.[4] What **is** new, at least to the United States and California, is the unique blend of private and public, business and social benefits and costs that the California HSR project will require.

We can define a few potential business models in order to emphasize how the business model interacts with a number of the issues the project now faces. We

[4] See, for example, Flyvbjerg, Bent, Nils Bruzelius and Werner Rothengatter, "Megaprojects and Risk: An Anatomy of Ambition," Cambridge University Press, 2003. See also SYSTRA and MVA Consultancy, "High-Speed rail Development Programme 2008/9," Evaluation Methodology, June 5, 2009, which includes British Government guidance to add 66% to capital cost estimates and 41% to operating cost estimates in order to account for "optimism bias.".

realize that this listing is not complete. Also, these models are simplistic and there are many variations of the models discussed. They do serve to illustrate the interrelationships between the business model and other issues the project faces.

The fully public, mass transit model. In this model, of which BART is an example, the Authority would acquire all needed property, manage and pay for the design and construction of the system, acquire rolling stock, set prices, collect revenues and manage operations including maintenance of rolling stock and infrastructure. This is the model for many public transit systems in the United States. Under this model, all risks would be for the Authority's account, and the Authority would be in position to ensure that prices are set such that the public receives maximum benefit from reduction in emissions and congestion as well as improved safety of rail over alternative modes. This model is often chosen when the benefits of a project are primarily public and revenues are not expected to cover financial costs. However, because the product in this case would be intercity rather than urban travel, the Authority would also be in the position of a public sector agency competing, possibly unfairly, with private sector airlines and bus companies as well as private automobile users.

The management contracting or "gross cost"[5] franchising/concessioning approach. Under this approach, the Authority would plan, build and finance the entire system, but would contract with a separate, usually private, entity to operate and maintain it. A number of short haul UnitedStates. rail passenger systems are operated in this way, including, for example, Caltrain and the Metrolink services where Amtrak serves as a cost-reimbursable operator for the State. It is also the emerging approach for private sector participation in many passenger railways in the European Union (E.U.) The Authority would retain essentially all cost and demand risk, but might be able to transfer some operating cost risk to the operating contractor or franchise (especially if the contract is put out for competition) and might be able to ask the franchise to bring commercial as well as operating expertise to the venture. Depending on the revenue level and the share of revenues the franchise is allowed to retain, there might or might not be an "operating subsidy" or there might even be an operating payment to the Authority.

A long-term "net cost" concession. The Authority would plan and construct a system to the basic capacity level expected by the Authority. Potential concessionaires would compete for a long term (15 to 30 years or longer) exclusive concession to operate the system. The concessionaire would set prices, make demand estimates and determine operating frequency and capacity

[5] Gross Cost franchising essentially means that a public agency owns a facility, specifies tariffs and expected demand, and awards a short-term (5 to 10 year), exclusive franchise to operate the system to a private enterprise. The company takes only the risk of the cost of operating the system at the specified demand level. It is possible under this model to ask the franchise to provide rolling stock, but only when there exists a short term leasing market such as provided by the ROSCOs in the U.K.

(subject to conditions established in the bid documents) and design and furnish rolling stock and any other commercially important assets. Depending on the commercial potential of the system and the limits set on tariffs, concessionaires might be willing to make substantial positive payments to the Authority, either for construction or for operations, again obviating the need for "operating subsidies." This is the initial model adopted for the suburban systems and Metros in Buenos Aires and Rio de Janeiro and it is similar to the models for operation of longer haul passenger franchises in the United Kingdom (U.K.) Under this model, the Authority would still retain all capital cost risk for the infrastructure, but might be able to transfer at least some of the commercial and operating cost risk, including the cost and the demand risk associated with the rolling stock. Depending on the form in which the concession payments are determined (fixed in advance, share of gross or net revenue, etc.) the Authority could recover some, or possibly a substantial share, of the capital cost of the infrastructure.[6]

The separated infrastructure approach. Under this approach, the Authority would design and construct the infrastructure and then allow (subject to control over schedules and dispatching by the Authority or its agent) a single operator or competing operators along with complementary operators to provide service. The Authority would impose an access charge based on capacity and use factors (monthly reserved train paths, train-miles operated, gross ton-miles operated, etc.). Under this approach, complementary short haul operators such as Caltrain might also pay access charges on an appropriate basis, but otherwise be independent of the Authority. This is the approach adopted by the E.U., though different member countries have adopted different sets of access charges that collect some part or all of the financial costs of the infrastructure.[7] The Authority would still retain essentially all capital cost risk of the infrastructure, including maintenance, and it would have to make decisions as to access charges and priority. On the other hand, it could, if desired, achieve competition **in** the HSR market (not just **for** the market as in exclusive concessions) and could disconnect the operations of essentially local agencies from that of the HSR operator(s). It could also transfer a substantial portion of the demand risk to the operator(s) and could achieve fully commercial operation of the system (in fact, airlines or bus companies might be bidders to operate trains, as is the case in the U.K., Germany and France). Depending on the commercial potential of the market and the access charges set, access charge revenues could make a contribution to recovery of the Authority's capital investment.

An essentially private approach in which the Authority would use its power to designate and acquire a right of way, establish broad system specifications, and then award an exclusive concession to a private consortium to design, build, finance, operate and maintain the system for a specified, usually long (>30 years)

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[6] A version of this model was proposed for California by the SNCF. See SNCF California Study, September 14, 2009.

[7] See, e.g. Thompson, Louis S. "Railway Access Charges in the EU: Current Status and Developments Since 2004," December, 2008, International Transport Forum, Paris.

term, or even permanently. This is in effect the public utility model under which Pacific Gas and Electric (PG&E) operates, except that PG&E has a permanent concession and its monopoly power essentially guarantees a predictable and sufficient demand, whereas airline and road competition would place a much more severe constraint on the behavior of a rail concessionaire. This model could in principle shift almost all the cost and revenue risk to the private sector and, depending on the policies of a regulator (which this approach would require) could generate a contribution to the Authority's investment costs or to State coffers.

There are many variations on the options, many of which are not mutually exclusive. Local governments can (probably should) be asked to finance the construction and operation of stations in return for a share of the local area development benefits that the system generates. This is especially important because good urban access to stations (financed by local authorities) will be a critical determinant of intercity high-speed rail demand. An electric utility could be permitted to finance and construct the entire electrical power supply system in return for agreement on an electricity tariff that would guarantee an appropriate rate of return. Emergence of a federal grant program similar to the Interstate Highway program would surely shift the financing balance among the participants in the system, while lack of such a program combined with restricted State and/or local funds would mandate that the private sector take a large role in finance and management with a consequent impact on who pays for the system, who manages it, and who bears what risk. It might also be possible to implement the models sequentially as actual cost and demand experience is gained: for example, it would be possible to shift from gross cost to net cost franchising when actual demand history has been established.

The group is not in a position to say which of these options the Authority should pursue. The Authority's actual decision must be the result of a careful balance of finances, private and public costs and benefits, and risk sharing, among other factors. We understand from discussion with the Authority that adoption of the fully public model is unlikely. Other analyses have argued forcefully that a fully private model is also unlikely, because the balance of public and private benefits is not suited to purely private financing. What the group does strongly believe, though, is that progress on the HSR system is critically dependent on action by the Authority to identify the business model option it will pursue or, at least, to start the process of selecting the preferred approach. It will not be possible for the group to reach a judgment on the viability of any plan or request for use of bond funding without a much better understanding of the Authority's proposed business model.

Management of Risk and Uncertainty: Hope for the Best, Plan for the Worst

Both the LAO and the Auditor emphasize their belief that the Authority's discussion of risk and uncertainty is too brief and too vague. We agree.

Many critical aspects of the system remain undefined. For example, the alignment of the system between San Jose and San Francisco remains as a set of general alternatives, all of which have potentially significant opposition. In addition, any lack of cooperation by the Union Pacific Railroad to joint use of ROW might well impact on the cost and service quality of the system in a number of areas. The rolling stock has not been selected. Even where more specific decisions have been made, the design status of the system is at best at the 15-30 percent stage. Under these circumstances, estimates of the total cost of the system are highly uncertain and, if our experience is any guide, more likely to go up than down. Compounding the issue is the fact that, as discussed below, the demand estimates are considered by experts to be unreliable and subject to a wide range of uncertainty.

Developers of a project are by definition optimistic; implementers of a project, and especially those who pay for it, demand realism, even measured pessimism. This is especially true when many of the uncertainties and risks of the project are inter-related. For example, efficient project implementation demands a predictable schedule and reliable funding, neither of which is possible at this point in the project. Environmental litigation alone (already threatened in a number of areas) can delay the project significantly, exposing it to cost escalation and disruption for which the Authority will have to pay.

Risk management consists of assessing the expected cost and the variability in all the major cost and demand categories and identifying ways in which the cost and variability can be reduced. Both the estimated cost and the variability in the cost for each component of the project should be adjusted based on the stage of design, actual award prices and the stage of construction. Doing so will give the Authority and the public a much better sense of the reliability and variability of the engineer's estimates. At this stage of the project, use of traditional methods such as an arbitrary 20 percent or 30 percent contingency applied to the engineer's estimates affords no such confidence.

Risk analysis also should include detailed sensitivity evaluation to ask all the "what if" questions that will govern the confidence with which the State and potential private investors can make decisions and take risks. It is the basis for "hope for the best, plan for the worst" evaluation that all professional investors (public or private) pursue.

Risk transfer or allocation is a different issue. In principle, risks should be borne by the party best able to define the risk and manage the outcome. For example,

assembly and acceptance of the ROW is generally a public responsibility that no private investor would be able to accept. By comparison, risks associated with procurement and maintenance of a defined fleet of rolling stock are well within the ability of the private sector to carry, but the (demand) risk of defining the size of the fleet accurately may need to be shared between public and private sectors. All risks can be transferred, but putting the risk in the wrong place is unduly costly and often illusory. In connection with the business model discussion above, the Authority needs a detailed discussion of the risks of the project and who will bear them, including a justification of why the chosen risk allocation is the optimum and why the business model chosen is appropriate to the risk profile of the project.

The Financial Gap between Currently Available Resources and Total Project Cost

The LAO and Auditor's reports both note that there is a large gap between the resources that are currently and reliably available for the project and the total estimated cost of the project, even assuming that current cost estimates and schedules are correct. This raises the issue of how the Authority will respond if the necessary resources do not materialize as expected, either in amount or in time. How will the gap be closed, and what will the Authority do if the gap cannot be closed? This question assumes greatly added importance given the uncertainty and unreliability of federal funding along with the state's structural deficit, over-reliance on federal funding and budget unreliability, and in light of the public concern over excessive government spending.

We agree that filling the financial gap is a question for which a more explicit answer is needed. There are two dimensions in particular that need attention: the need to achieve operable segments with the money available, especially in the light of the timing requirements to qualify for the Federal American Recovery and Reinvestment Act (ARRA) money; and reassessment of the business model in the light of the actual and likely ability of the various parties to raise money.

The operable segment issue suggests that the Authority should concentrate its attention on those segments that will have at least some independent utility and for which the required environmental clearances can be completed in time to meet federal stipulations. The Authority did this in its original application to the Federal Railroad Administration (FRA) requesting that the San Francisco to San Jose and the Anaheim to Los Angeles segments be funded, along with a segment in the Central Valley for use in testing and proving the capabilities of track and rolling stock design.

Unfortunately, not even one of these parts can be finished with the money currently in hand, because the original federal award was only $2.25 billion[8] (as

[8] In fact, it is $400 million less because of the allocation of this amount to the Trans Bay Terminal in San Francisco.

opposed to the $4.7 billion assumed in the 2009 Business Plan) and because the bonding requirement of an equal match with other funding would limit bond funding to the same amount. Moreover, the Bay Area segment is under challenge for environmental reasons and the Los Angeles to Anaheim segment is being challenged on both cost and environmental grounds. There is also continuing controversy over the choice between the Altamont Pass route and the Pacheco Pass route.

We understand that the FRA has recently awarded an additional $731 million to the Authority in the latest round of ARRA decisions. We also understand that the FRA has required the Authority to concentrate all funding on only one segment, thus posing a dilemma. If funding is concentrated on one of the Central Valley segments, the Authority might be able to demonstrate high-speed trains in California, but, if the overall project is not fully completed, a single segment in the Central Valley will have limited utility and questionable financial or economic viability. If the Authority focuses the money on either the San Francisco/San Jose or Anaheim/Los Angeles segments, the result would have considerable independent utility, but would not demonstrate high speed operation and, in the case of San Francisco/San Jose would not actually constitute "intercity" service as defined by the FRA. We understand from public statements that the Authority has concurred with FRA and intends to concentrate federal funding in the Central Valley, though the specific segment(s) to be completed remain under consideration. If this is the Authority's decision, we then urge the Authority to review and recast its Business Plan to reflect the impact on schedules and operations of adopting this sequence of implementation. We also urge the Authority to develop a plan for the phased implementation of the entire San Francisco to Anaheim route consistent with the description of the project contained in Proposition 1A.

The business model issue is also relevant here because the contribution of each of the parties will depend on availability of funding as well as an evaluation of benefits and costs. If public money is too limited to permit a desired business model to work, then a different business model will be needed that gets more funding from, but shifts more authority and responsibility to, the private sector and/or to local authorities.

As discussed above, there are models, such as net cost franchising/concessioning or even heavily private models, which could in theory encourage the private sector to generate a lot more funding than currently contemplated to fill the gap. This would, however, call for a significant change in the currently planned role of the Authority from one that designs and contracts for construction and supervises operations to one that issues general requirements for the system and then awards a concession to the best private bidder, and it would have to be based on an investment grade financial plan that included an adequate rate of return for the private partners. Again, this highlights the critical importance of the development of a business model for the project that is

consistent with the roles, responsibilities and actual financial resources and expectations of all of the potential participants.

The lack of a clear financial plan is a critical concern. The group fully realizes that developing a credible financial plan is difficult depending, as it does, on a large number of decisions not yet made and on factors far beyond the control of the Authority. For example, in a deteriorating budget climate in which even large and highly beneficial projects such as the new rail tunnel from New Jersey to New York City are abruptly canceled because of a shortage of state funds to cover a potential overrun, and in which the likelihood of new large Federal funding programs appears small, there is an air of unreality about a plan that includes $17 to $19 billion in "free" Federal funding from programs that do not yet exist. The same can be said of the expectation for large local or State funding for stations and area development when local governments are highly stressed and when the finances of the State are sufficiently weak that a sale of $9 billion in State General Obligation bonds might only be possible (if at all) at unusually high interest rates.

For these reasons, the project, as of now, has only limited credibility with private investors. The demonstration of firm Public Sector financial commitments will be an absolute necessity, prior to approaching sources of private capital. In our discussion with Roelof van Ark, it is clear that the Authority recognizes the "chicken and egg" nature of the conundrum: the Authority cannot get private investment without a solid prospect that the project will be completed and it cannot complete the project without private investment that would make the project successful.

Demand Modeling and Estimating

Both the LAO and the State Auditor point to the importance of having the best possible demand estimates. We agree that improvements should be sought both in the models themselves and in the transparency of the results.

The California Senate Transportation and Housing Committee commissioned a study by the Institute for Transportation Studies at UC Berkeley. The study[9], which was issued on June 30, 2010, concluded that there are "significant problems that render the key demand forecasting models unreliable for policy analysis." (pg 2) The study further concluded that "…the combination of problems in the development phase and subsequent changes made to model parameters in the validation phases implies that the forecasts of high speed rail demand – and hence of the profitability of the proposed high speed rail system – have very large error bounds. These bounds, which were not quantified by CS [Cambridge Systematics], may be large enough to include the possibility that

[9] Brownstone, David, Mark Hansen and Samer Madanat, "Review of 'Bay Area/California High-Speed Rail Ridership and Revenue Forecasting Study,'" Institute for Transportation Studies, University of California, June 30, 2010.

California HSR may achieve healthy profits and the possibility that it may incur significant revenue shortfalls. We believe that further work to both assess and reduce these bounds should be a high priority." (pg 3)

The Authority must have demand and revenue forecasts that are reliable for policy and financial analysis; without them there is little basis for proceeding. We recommend that the Authority work with UC Berkeley and Cambridge Systematics on an expedited basis to complete the analysis of the issues in the demand modeling, especially biases in model coefficients and the reliability of the estimates, in order to develop estimates that are generally agreed to be the best that can be obtained. This does not mean that completely reliable estimates will ever be possible; instead it requires that the estimates should be improved as much as possible, and the likely range of error should be clearly defined and stated.

It is also important to assess what the risk of a poor demand estimate is and who should carry it. At one level, if the demand estimates are grossly optimistic (not an unknown result) then there could be an actual demand level below which the system should not have been built at all. There could be a somewhat higher demand level at which the operating costs can just be covered so there would be no "subsidy," though a public contribution to capital might be needed. There could be a higher demand level at which the sum of the public and private benefits clearly exceed public and private costs, justifying building the system with an appropriate balance of public and private contribution. Finally, there might be a very high demand level at which the system is financially profitable and no significant public contribution is needed. The current demand estimates are not capable of defining these levels or of assessing the likelihood that any might be met.

If the system is built, however, a very large part of the investment cost in infrastructure is essentially independent of demand. A high-speed rail system has certain minimum standards of curvature and gradient, which essentially fixes the cost of acquiring the ROW once the basic alignment has been set. The system will have to be double-tracked at a minimum, and will require electrification, though some aspects of the electrification might depend on operating volume. Stations will be needed, though station size might be adjusted somewhat. The Bay Area and Los Angeles to Anaheim segments may offer some savings of common operation of multiple services, but most of the system must be dedicated for high-speed rail use only.[10]

This means that if the basic system were built with public money, then the remaining demand risk would relate primarily to the size of the rolling stock fleet

[10] The legislative trip time requirement applies to Los Angeles to San Francisco, which means that high-speed priorities must prevail over local train priorities in the San Francisco to San Jose segment. By contrast, since Los Angeles to Anaheim is not covered by the trip time requirement, there is more flexibility to develop a joint operating approach considering costs and local preferences.

and the cost of operating the system at the actual demand level given the fares charged. It is quite possible that a private operator, making its own demand estimates, would be willing to take this level of risk, especially if any payments made for the use of infrastructure were completely variable with actual as opposed to projected use.

Under this assumption, the current demand estimating needs only to carry a desired level of confidence that the system will have enough demand to justify construction, where the justification can be based on expected net revenues along with public net benefits. This would effectively leave all capital cost risk with the Authority. Subsequent, private demand estimates would determine operating patterns, tariffs and fleet size, leaving this part of demand risk in the hands of the operator. Access payments by the operator to the Authority for the use of the infrastructure could pay back some, or all, of the public investment, depending on actual demand levels and the Authority's financial objectives. As stated before, it will depend on the business model chosen.

Need for a Revenue or Demand Guarantee.

Both the LOA and the State Auditor challenged the possibility raised by the Authority that some of the initial demand risk will need to be shifted from the operator to the Authority by having the Authority guarantee a stated level of revenue or demand below which a payment would be triggered. Such a payment could be considered to be an "operating subsidy" that is prohibited under the terms of AB 3034.

We believe that this question is primarily relevant within the type of business model adopted. For example, if the Authority offered a long-term net-cost concession in which the concessionaire has to design, build, finance and operate the entire system along with acquiring rolling stock, it is highly likely that a significant part of the demand risk would have to be assumed by the Authority through some kind of revenue guarantee unless, of course, the demand estimates are agreed to be so high that the profitability of the system is beyond doubt (as of now, they are not that high). On the other hand, if the entire system were designed and built by the Authority with no charge for use by the operator, and if the rolling stock were bought by the Authority and leased for a nominal fee to the operator, with the operator's revenues covering only operation and maintenance costs, the need for an added demand guarantee is probably minimal and the issue of a "subsidy" would not arise. The actual outcome can only be assessed through improved demand forecasting, including sensitivity analysis.

In fact, obtaining an agreed definition of the term "operating subsidy" has become critical. A recent report (Enthoven, Alain C., William R. Grindley and William H. Warren, "The Financial Risks of California's Proposed High-Speed Rail Project," Community Coalition on High Speed Rail, October 2010, see www.cc-hsr.org)

argued that all interest payments on State bonds should be considered as a part of operating costs, whereas the Authority has based its Business Plan on excluding State bond interest (and most other recovery of capital costs) from funds to be repaid by the Authority. We encourage the Authority to seek clarification from the Legislature on the definition of what costs and revenues should be included within the term "operating subsidy." This will significantly affect the legal viability of the project and the choice of business model.

The "Financial Risks" study also highlights the confusion between **financial** analysis, which is the basis for private sector involvement, and **economic** analysis, which is the basis for public involvement. The study makes a series of critical comments on the 2009 Business Plan and deserves careful attention and response from the Authority, as we share many of the same concerns. At the same time, the study is limited to financial analysis, while ignoring all of the reasons – consumer surplus, reduction of congestion on rural and urban highways, airports and airways, reduction of pollution and carbon emissions, and reduction of accident costs, among others – that would be included in an economic analysis to evaluate public involvement in the project. The treatment of public benefits was much more detailed in the 2008 Business Plan than in the 2009 Business Plan. The 2008 and 2009 Business Plans appeared to show that public benefits might be a significant multiple of purely financial benefits (revenue minus operating and private financial costs). Given the importance of the issue in the overall evaluation of the project, and the close interrelation of public benefits with demand forecasts, we strongly encourage the Authority to include a thorough and updated treatment of public benefits and costs in the 2010 Business Plan and to link these results with the definition of "operating subsidy."

ROW and Alignment Availability

One of the most important remaining physical and investment cost uncertainties in the project is the availability and cost of the ROW. This is partly because of the extreme opposition that the building of urban railroad segments always engenders (aggravated by the need of high-speed trains for an unusually straight and flat alignment), partly because of concerns previously expressed by the Union Pacific Railroad, , partly because of the continuing controversy of the Pacheco versus Altamont routes, and partly because of the uncertainty in the type of service to be provided between Anaheim and Los Angeles. The importance of these questions has thus far been minimized by the retention of alternatives, either for routes, or by use of tunnels or raised tracks.

Project budgets cannot be improved and schedules cannot be established until the alignment and the service plans are finished. More important, any future changes as a result of compromise or litigation can have a disproportionate impact on schedule and costs, because a high-speed railway is a system of inter-related elements in which one change can have impacts on many other system components.

It will be critical that the Authority move as quickly as possible to finalize the alignment. In addition, given the uncertainty of the resolution of litigation over the alignment, which might cause alignment re-routings or use of more than expected tunneling, the Authority should acknowledge the risks and develop an explicit approach to managing and minimizing them.

Technical, Safety and Seismic Issues

There has been limited information from the Authority regarding such issues as the type of track to be used. For example, what proportion of the project will be at-grade, in tunnel and/or elevated? These decisions will have significant cost implications. For example, analysis of the cost of the high speed rail project in China revealed that the cost of elevated track was approximately double the cost for at-grade track and the cost of tunnels was double the cost of an elevated configuration. Any decisions made by the Authority in this area will have significant financial implications for the project. The same can be said of train speeds and seismic-related issues. Specifically, train speeds in China, due to safety reasons, mandated that the track be grade- separated, either in tunnel or elevated. Also, given the seismic issues in California, larger foundations will be needed, resulting in higher system costs, perhaps by as much as 60 percent. The Authority needs to make a clear decision on these issues.