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April 2, 2020

California High Speed Rail Authority
Attn: Draft 2020 Business Plan
770 L Street, Suite 620 MS-1
Sacramento, CA 95814

Subject: Draft 2020 HSR Business Plan Comment Letter

To Whom It May Concern:

The Town of Atherton and its Rail Committee have reviewed the High-Speed Rail Authority's Draft 2020 Business Plan and believe that the construction cost, revenue, patronage and train performance assumptions in the Business Plan are overly optimistic and unlikely to be realized. Additionally, the funding and right-of-way challenges are significantly underestimated. The purpose of this letter is to invite the Authority's attention to issues that are not adequately addressed in the Draft Business Plan.

1. Proposition 1A

The Plan states that the Phase 1 high speed rail service between San Francisco and Los Angeles Union Station will meet all of the requirements of Proposition 1A. As planned, the service cannot meet two key requirements of Proposition 1A, (1) non-stop service between San Francisco and Los Angeles Union Station in less than 2 hours 40 minutes, and (2) high speed rail service in the corridor or useable segment thereof will not require an operating subsidy.

Travel Time Constraint

Though Exhibit 1.3 Comparative Travel Times shows a total "non-stop" travel time of 2 hours and 40 minutes between San Francisco to Los Angeles, it is of interest to note that the preliminary schedules included in the Authority's 2018 Business Plan included a minimum non-stop travel time between San Francisco and Los Angeles Union Station of 3 hours 8 minutes. It should be noted that travel times between San Francisco and Los Angeles will exceed the 2hour-40-minute requirement. Chapter 1, page 18 states "Although flying may be faster for some trips, in terms of actual flight times, a relatively fast hour-and-a-half flight can quickly turn into four or more hours when getting to and from the

airport, going through security and waiting in line to board are factored into the travel equation.” This statement does not consider the eventuality that high-speed rail may require safety screening similar to that required at airports. After consideration of system stops (certainty) and security screening (likely), the travel time comparison between high-speed rail and air travel will favor air travel.

There is little evidence that the supposed travel times listed in the Business Plan can be met. The decision to route the high-speed rail line through Palmdale almost certainly eliminates the possibility of achieving the travel time requirement. The Tehachapi Mountains impose a 3,000 ft. elevation change between the southern end of the San Joaquin Valley and the top of the Tehachapi pass. The steep grade of at least 3 percent required to ascend the 20-mile grade requires greatly reduced speed for the ascent and poses a serious risk for the descent. Federal requirements specify escape sidings or level portions of track at regular intervals to keep descending trains under control. Another steep grade between Palmdale and Santa Clarita with an elevation change of 1,500 ft. over 20 miles would also require lower train speeds.

The fastest high-speed train (non-maglev) in commercial service has a top speed of 350 km/h (217 mph). The only high-speed rail system, worldwide, to operate at this speed is in China, where a terrible accident caused them to reduce operating speeds to a maximum of 186 mph for six years. Though China has been able to resume running trains at 350 km/hr, the maximum speed of high-speed trains outside of China is between 300-320 km/hr (186-198 mph) with a majority having a maximum speed of between 200-250 km/hr (124 – 155 mph). The above speeds are listed as maximum speeds with stop to stop speeds maxed out at 317 km/hr (197 mph) in China and 272 km/hr (169 mph) outside of China. Thus, there is little operating evidence to support the Authority’s ability to maintain operating speeds of 220 mph, particularly as a new operator.

Though the Authority offered to support their claim to meet the travel time requirements using a set of speed-distance curves transmitted with a memorandum by Mr. Frank Vacca in 2013, these curves illustrated a speed of 220 mph down the Tehachapi grade with no safety features in place. It also illustrated speeds of 220 mph through Fresno and Bakersfield despite claims by the Authority’s chairman that trains would be slowed to 125 mph through urban areas.

The errors in Mr. Vacca’s curves were carefully analyzed and published in the paper, “Independent Determination the Travel Time Requirements of Proposition 1A Cannot be Met” by Paul S. Jones, PE, PhD, dated March 13, 2015. The paper describes a detailed analysis of the San Francisco-Los Angeles Union Station route following the Authority’s selected route and calculating grades and curves as appropriate leading to a minimum travel time of 3 hours 7 minutes. This time calculation is consistent with the 3-hour 30-minute travel time listed in the 2018 Business Plan (page 118).

Operating Subsidy

To meet the Proposition 1A requirement that high-speed rail service not require an operating subsidy, the Authority is considering the option to change its business model from owner/operator to infrastructure owner, leasing out its infrastructure to an operator to provide service. Though this is commendable and may result in lower rail service operating cost, it appears to be an interim recommendation for the Bakersfield to Merced line, transitioning back to an owner/operator model when Valley to Valley service is offered. Due to high start-up costs and uncertainties with the system, it is unlikely that the Authority will be able to find a short-haul high-speed rail operator without a long-term commitment and/or the potential to operate the entire system. As such, there is a great likelihood that such a lease option may not generate much if any revenue and thus require operational support (subsidy) from the Authority.

The analysis conducted by the Early Train Operator in its analysis of the Merced to Bakersfield segment concludes that though “faster service and greater connectivity provide the highest ridership potential and fare revenue of any other investment option”, even forecasting a doubling of ridership to 8.8 million annual systemwide riders in 2029, it would result “in a lower State operating subsidy.” The need for a subsidy is contrary to meeting the requirements of Proposition 1A.

2. Ridership forecasts

Cambridge Systematics has created an immense econometric model to generate traffic data for the different stages of the high-speed rail service, Merced to Bakersfield, Valley to Valley, and Full Phase 1. To support this work, they have conducted extensive surveys to generate current travel information. Trips were divided into short distance, 50 miles or less, and long distance, over 50 miles. It would have been more accurate to eliminate all trips of 50 miles or less, because high speed rail has little, if any advantage, to offer for these trips. As with all econometric models, despite their detail, data are ultimately grouped for analytical convenience and cannot represent the full range of variations in individual travel choices.

William Grindley and William Warren have made an exhaustive study of origin-destination pairs using Cambridge Systematics zones and the Authority’s selection of conventional rail and bus service for connections to the high-speed rail, including schedules that permit waiting times to be calculated. This study was performed for 320 travel zone pairs. Travel times and costs were compared for high speed rail, driving, and air travel, when appropriate. Grindley and Warren in their paper, “If You Build it, They Will Not Come—Sequel” Grindley and Warren found that for trips that require long connections to high speed rail via other modes, like a bus from Sacramento to Merced, or a bus from Bakersfield to Los Angeles, in only 7 percent of the trips is high speed rail faster than or equal to driving. Giving every possible advantage to high speed rail, Grindley and Warren concluded that actual travel on high speed rail is likely to be no more than one fifth of Cambridge Systematics’ estimates.

Taking another view, for other high-speed rail services around the world, high speed rail is most competitive with air travel for trips of 200 to 500 miles where access and egress are comparable between air and high-speed rail. This strongly suggests that the major market for Phase 1 of California's high-speed rail service is the 12 million annual air trips between San Francisco and Los Angeles today. Some travelers would enjoy a periodic variation from flying, others could be converted to true high-speed rail enthusiasts. The total number of air travelers is only half of the 24.5 million high speed rail users that Cambridge Systematics used as the low estimate for high speed rail in 2035. Additional travelers would certainly be attracted for the novelty of the new mode, but to expect high speed rail to capture all of the air travel market is not reasonable.

If passenger traffic fails to come even close to the Cambridge Systematics estimate, then revenue will also fall far short of the level needed to avoid subsidizing high speed rail travel. This is expressly contrary to the requirements of Proposition 1A.

AB3034 also requires a detailed funding plan for each operable segment and that all sources of funds and the time of their receipt be specified before work can be initiated on any segment. Page 15 of the Plan states that the funding shortfall for the Silicon Valley to Central Valley (presumed to be San Jose to Shafter) is approximately equal to the cost to complete the tunnels through the Pacheco Pass, by far the most expensive piece of the work. The funding for this work is heavily dependent on Cap-and-Trade money from the quarterly actions. The amounts of these funds are inconsistently reported throughout the Plan. Page 37, Exhibit 3.3, lists the Cap-and-Trade proceeds from the most recent 11 quarterly auctions allocated to the Authority. These total approximately \$1.218 billion. On page 37, the Plan states that the Authority has already received \$1.618 billion in Cap-and-Trade, including a special grant. Per Exhibit 3.3, the average annual (measured to August) allocation to the Authority has been approximately \$330 million. The plan assumes an annual allocation of \$700 million, up from \$500 million in the 2016 Business Plan. It seems unlikely that future Cap-and-Trade funds will increase this substantially such that they can provide the needed funds to complete the Valley to Valley segment.

3. Construction Costs

Like all mega-projects worldwide, California's high-speed rail system is costing much more than expected or estimated. The Central Valley section was selected for initial construction because the land is relatively flat and seemed to offer the least expensive site to build a 100 plus mile track for testing and initial service. The Business Plan estimates that the cost of this section will be \$15.6 billion. However, as yet, no track has been laid, no poles to support electrification have been installed, no wire has been stretched and no train control system has been implemented, nor have electric sub stations been installed. Caltrain is spending \$2.3 billion to electrify its 52-mile system, suggesting that there may be overlooked costs for high speed rail.

Comments regarding project cost assumptions and projections have been provided on the various Draft Business Plans issued by the Authority. Though no response to comments is directly given, each subsequent study conducted by the Authority shows an increase in costs and new baselines for the project. Page 99 states “As a result of these reviews, our 2019 Project Update Report increased our Program Baseline for the Central Valley Segment by \$1.8 billion”. This 2019 Baseline adjustment for the Central Valley segment is approximately a 17% increase from the \$10.6 billion cost estimate in the 2018 Business Plan. These costs grow substantially with the scope expansion to extend the lines to Merced and Bakersfield, with total costs currently estimated at \$20.4 billion in comparison to the \$15.6 billion baseline shown.

These ever-increasing costs are exacerbated by the uncertainty of funding for the project.

4. Right of Way Acquisition

The Plan states that acquisition of Right of Way is of critical importance and refers to challenges associated with acquisitions in the Central Valley. The Plan further indicates that the Lean Six Sigma approach has been used to optimize right-of-way procurement, choices made in project alignment and facility placement that have a significant impact on right-of-way costs and challenges. It is not clear that the approach has changed sufficiently to result in better choices regarding facility placement and right-of-way needs. As a critical example, rather than locating main facility yards in low density/low cost areas, the project proposes a light maintenance facility in the Brisbane Baylands development area. The selected location is in the heart of a planned development, approved by voters, which provides 2,200 housing units to assist in addressing a regional housing shortage and 7,000,000 sq. ft. of commercial space. The cost of acquisition will be based on the approved use of the site, which will be rather significant and is likely under budgeted by a significant amount.

5. Funding

The Plan makes a great effort in indicating the project’s compliance with Federal funding requirements, including targets and milestones associated with American Recovery and Reinvestment Act (ARRA) funding. Though the Plan states that \$2.5 billion in ARRA funding was expended, the Authority has only been able to secure \$477 million in reimbursements from the FRA. As the FRA disengaged on work related to the project and de-obligated \$929 million from the project, there is a significant financial risk to taxpayers if these expenditures are not reimbursed. Focus should be on minimizing taxpayer cost and risk until reimbursement of these funds is more certain. A great reliance is also placed on State Cap-and-Trade funds. With the statewide housing crisis, there is a great likelihood that these funds may be tapped to assist in meeting state and regional housing needs. Additionally, the availability of current year Cap-and-Trade funds will likely be reduced related to the economic slowdown related to the CLOVID-19 outbreak.

With the state goal to have 5 million zero-emission vehicles (ZEV) on the road by 2030 and 100% of new vehicle sales to be ZEV or plug-in hybrid electric vehicles (PHEV) by 2050, the refining of fossil fuels will decline as will the need to purchase Cap-and-Trade credits by refiners and others related to the automobile industry.

6. Green House Gas Emissions

One of the important benefits that HSR has long claimed is a reduction in GHG emissions, presumably as a result of replacing trips taken in private automobiles, planes or buses by a large ridership on the electrified train. While the basis of the quantified claims are not explained, the reductions are reported with considerable precision (to 3 decimal places). Plan Tables 6.2 and 6.3 show the estimated number of riders (Table 1 below) and the associated reduction in GHG Emissions (Table 2 below) for the full Phase 1 implementation out through 2060.

Table 1: Ridership Estimates (from 2020 Plan)

Table 6.2: Phase 1 High, Medium and Low Ridership By Year (Riders in Millions)

Ridership Level	2033	2034	2035	2040	2045	2050	2055	2060
High Ridership	17.9	36.4	41.9	50.0	52.6	55.2	58.1	61.0
Medium Ridership	12.8	27.8	32.0	38.6	40.5	42.6	44.8	47.1
Low Ridership	10.3	21.3	24.5	29.3	30.8	32.3	34.0	35.7

Table 2: GHG Reductions (from 2020 Plan)

Table 6.3.2: Phase 1 GHG Reductions by Year (in Millions Metric Tons of Carbon Dioxide Equivalent)

Ridership Level	2033	2034	2035	2040	2045	2050	2055	2060
High Ridership	.615	1.314	1.504	1.775	1.853	1.943	2.042	2.146
Medium Ridership	.480	1.073	1.229	1.459	1.524	1.598	1.680	1.765

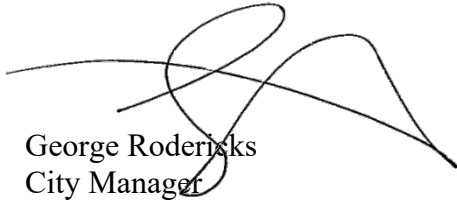
A simple calculation of the amount of GHG reduction per rider is shown in Table 3 below. Two points are noteworthy. The reduction in GHG emissions per rider is extremely small. There appears to be a steady relationship between ridership and CO₂ reductions that holds over time (77.3 – 79 lb/rider). The data appear to be related to length of trip (associated with additional segments opening to ridership) vs gasoline powered cars. There seems to be no acknowledgement that vehicle emissions, and thus the comparative GHG, are required to be reduced over the corresponding time periods, nor the state’s goals of 5 million zero emission vehicles (ZEV) by 2030 and 100% of new vehicle sales to be ZEV or plug-in hybrid electric vehicles (PHEV) by 2050.

Table 3: Reductions of GHG per rider

Year	2035	2040	2045	2050	2055	2060
Ridership (in millions)	41.9	50	52.6	55.2	58.1	61
GHG Reductions (in millions of metric tons per year)	1.504	1.775	1.853	1.943	2.042	2.146
Reductions/rider (metric tons CO ₂ /rider)	0.036	0.036	0.035	0.035	0.035	0.035
Reduction/rider (pounds CO ₂ per rider)	79.0	78.1	77.5	77.4	77.3	77.4

In summary, it is unlikely that the project will be able to meet its service requirements outlined in Proposition 1A, that the funding availability, ridership, revenue, and greenhouse gas reduction projections are overly optimistic and the project cost and delivery time table are significantly under estimated. We urge the development of a full funding plan that accounts for the de-obligation of federal funds and the likely reduction in Cap-and-Trade funds.

Sincerely,



George Rodericks
City Manager

cc: Senate Committee on Transportation, Hon. Jim Beall, Chair
Assembly Committee on Transportation, Hon. Jim Frazier, Chair
Legislative Analyst Office, Gabriel Petek, Legislative Analyst
City Council
Atherton Rail Committee Members