



**CALIFORNIA
HIGH-SPEED RAIL
AUTHORITY**

ADDENDUM

TO

2012 PARTIALLY REVISED FINAL PROGRAM EIR

April 19, 2012

PURPOSE OF THIS ADDENDUM

This Addendum provides additional information regarding high-speed train project benefits. The Addendum briefly summarizes key project benefit information from the Partially Revised Final Program EIR (Program EIR), and describes assumptions about the high-speed train system upon which those benefits were identified. The Addendum also provides additional information on how those benefits may be lower than described in the Program EIR, based on scenarios and assumptions contained in the Revised 2012 Business Plan. This information is intended to reflect the potential range of possible outcomes for high-speed train project benefits in the future, and to ensure consideration of the lower range of benefits in the decision making process.

This additional information is appropriately addressed in this Addendum, to be considered as part of the Partially Revised Final Program EIR. This additional information does not constitute a change in the proposed high-speed train system, and does not identify new or more severe adverse environmental impacts, or any changes to the discussion of adverse environmental impacts from the high-speed train system. Neither does the additional information change the feasibility of any alternatives or mitigation strategies that were considered infeasible or not reasonable for purposes of program-level analysis. This additional information on project benefits therefore does not meet the criteria for recirculation of the Partially Revised Final Program EIR.

I. ENVIRONMENTAL BENEFITS DESCRIBED IN 2012 PARTIALLY REVISED FINAL PROGRAM EIR

The 2012 Partially Revised Final Program EIR includes information on project benefits. These benefits occur in the areas of reduced automobile vehicle miles travelled (VMT) and reduce plane trips, reduced energy use for transportation, and reduced air pollution from transportation sources, including reduced emissions of greenhouse gases (GHGs). These benefits were derived based on certain assumptions in the Program EIR, which included that the entire 800-mile system (Full System) would be operational and serving 88 to 117 million riders annually by 2030. The low forecast of 88 million riders annually was utilized to assess project benefits in 2030 in the areas of traffic, air quality, and energy and to compare them to the No Project Alternative in 2030. (2008 Final Program EIR, Chapter 2, Table 2.3-3.)

BENEFITS FROM REDUCTION IN VMT AND AIRPLANE TRIPS

The high-speed train project would provide a new travel mode and divert automobile trips to high-speed train trips. The 2008 Final Program EIR identified a VMT reduction of 26.682 million miles daily for the preferred Pacheco Pass network alternative as compared to the No Project Alternative in 2030. (2008 Final Program EIR, page 3.3-16; 2008 Addendum/Errata, page 3.3-16.) The diversion from automobile to high-speed train was estimated to reduce VMT on the state highway system by 2.3% statewide. (2008



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Addendum/Errata, pages S-11, S-12.) The high-speed train would also divert air travel in the amount of 43,865 daily trips for the preferred alternative. (2008 Final Program EIR, page 3.3-16; 2008 Addendum/Errata, page 3.3-16.) The reduction in both automobile VMT and air travel would provide benefits in the form of reduced congestion on both the state's highway system as well as at airports.

BENEFITS FROM REDUCTION IN AIR POLLUTION AND GHG EMISSIONS

The high-speed train project would decrease air pollution statewide by reducing pollutants generated by automobile and aircraft combustion engines, as a result of the reduced automobile and aircraft VMT and reduced congestion. The Program EIR calculated reductions for statewide emissions of CO, PM₁₀, PM_{2.5}, NO_x, TOG, and CO₂. As compared to the No Project Alternative in 2030, all air pollution emissions would be reduced. (2008 Final Program EIR, chapter 3.3; 2008 Addendum/Errata, pp. 3.3-16, 3.3-21; 3.3-22, 3.3-26.) The reduction in greenhouse gas emissions was estimated to be a 0.5 % reduction for the preferred alternative. (2008 Addendum/Errata, pp. 3.3-22, 3.3-27.) This amounts to a reduction of roughly 3.4 million metric tons of CO₂ emissions annually in 2030 (or 6.8 billion pounds of CO₂ emissions annually). (2008 Addendum/Errata, page S-11.)

BENEFITS FROM REDUCTION IN ENERGY USE

The high-speed train project would provide a new travel mode, divert automobile trips, also divert trips from air travel, and result in less energy use for transportation. The 2008 Final Program EIR identified that energy consumption per passenger mile traveled is much less for a high-speed train mode than for either the air or automobile modes. (2008 Final Program EIR, page 3.5-14; 2008 Addendum/Errata, page 3.5-14.) A high-speed train requires about one-third of the energy required for an airplane to carry a passenger 1 mile, and less than half that required for an automobile to carry a passenger 1 mile. (2008 Final Program EIR, page 3.5-14.) As compared to the No Project Alternative in 2030, the HST would reduce transportation energy consumption by 33,668,055 MMBtus annually, or the equivalent of a reduction in 5.8 million barrels of oil annually. (2008 Final program EIR, page 3.5-13, Table 3.5-4; 2008 Addendum/Errata, page 3.5-14.)

II. ENVIRONMENTAL BENEFITS BASED ON SCENARIOS IN REVISED 2012 BUSINESS PLAN

The Authority's Revised 2012 Business Plan describes an implementation strategy or "road map" for how construction of the high-speed train system is expected to proceed. The plan includes more information about how construction of the different individual sections of the high-speed train system will be phased, when different subsets of the entire system will be operational, what level of ridership can be expected at each phase, and what level of benefits can be expected. The Revised 2012 Business Plan is a statutorily mandated plan. Public Utilities Code section 185033 requires the Authority to develop a plan with the content specified in that statute and offer it for public review and comment. Following extensive public comment, the Authority considered and adopted the Revised 2012 Business Plan on April 12, 2012.



Key Assumptions in Revised 2012 Business Plan

The Revised 2012 Business Plan includes assumptions about how the high-speed train project will be constructed and become operational that are different from the assumptions in the Program EIR. The Revised 2012 Business Plan refines the phased implementation approach identified in the Program EIR, and explains that higher costs and funding limitations will result in the high-speed train system being completed and operational later than anticipated in the Program EIR. Specifically, an Initial Operating Section is estimated to be completed by 2021, with a Bay to Basin phase by 2026, and a Phase 1 Blended System by 2029. A Full Phase 1 system is identified as operational in 2033. The plan does not include an anticipated date for construction and operation of the Full System (Phases 1 and 2). (Revised 2012 Business Plan, p. ES-14; chapter 2; p. 5-17.) As discussed above, the Program EIR assumed the Full System (Phases 1 and 2) would be operating and generating benefits in 2030. (2008 Final Program EIR, Table 2.3-3.)

In addition, the Revised 2012 Business Plan presents lower ridership forecasts than included in the Program EIR. This is the case because the Business Plan ridership forecasts are intended to represent a cautious view of the future use of the HST system, for the purpose of developing a conservative, business-focused implementation strategy and plan. (Revised 2012 Business Plan, pp. 5-17, 5-20, 5-21.) In addition, this results from forecasts of only a portion of the Full System analyzed in the Program EIR. Whereas the Program EIR calculated its benefits with a forecast of 88 million riders in 2030 assuming the Full System (both Phase 1 and Phase 2) would be constructed and operating by 2030, the Business Plan includes lower ridership based on forecasts assuming that only Phase 1 Blended is constructed and operating as of 2030. The range includes 16.1-26.8 million riders in 2030, 19.6-31.8 million riders in 2035, and 20.1-32.6 in 2040, and increasing thereafter as shown in Table 1. (Revised 2012 Business Plan, p. 5-17.) Since project benefits in the areas of decreased automobile VMT and plane trips, reduced air pollution and GHG emissions, and reduced transportation energy use are based on use of the high-speed train system, it is reasonable to expect that the lower ridership forecasts from the Revised 2012 Business Plan scenarios would lead to benefits in these areas accruing more slowly than anticipated in the Program EIR. (See Partially Revised Final Program EIR, pp. 5-5 and 5-6.) The following provides more information on the level of benefits that can be anticipated if future conditions in 2030/2035/2040 are more similar to the Revised 2012 Business Plan scenarios than to the scenario presented in the Program EIR. For purposes of this analysis, the benefits are identified as a range based on the Business Plan low and high ridership scenarios in 2030, 2035 and 2040, assuming a Phase 1 blended system.



Table 1 – Phase 1 Blended Ridership Forecasts

Scenario	2030	2035	2040
Phase 1 Blended Business Plan High Scenario	26.8	31.8	32.6
Phase 1 Blended Business Plan Low Scenario	16.1	19.6	20.1

Source: Revised 2012 Business Plan, p. 5-17

BENEFITS FROM REDUCTION IN VMT AND AIRPLANE TRIPS

Based on Business Plan ridership forecasts for a Phase 1 blended system, benefits would occur for both reduced automobile VMT and air travel, but the benefits would be lower than described in the Program EIR. The automobile VMT reductions for a Phase 1 blended system in 2030, 2035, and 2040 based on Business Plan scenarios are shown in Table 2:

**Table 2 - Vehicle Miles Traveled (VMT) Changes
(Millions of Miles Daily/Millions of Miles Annually)**

Scenario	2030	2035	2040
High Scenario			
Phase 1 Blended*	-11.6 / -4,000	-11.9 / -4,000	-12.2 / -4,000
Low Scenario			
Phase 1 Blended	-7.3 / -3,000	-7.5 / -3,000	-7.7 / -3,000

Source: Revised 2012 Business Plan, Ridership and Revenue Forecasting Final Technical Memorandum; GHG Analysis for Phase 1 Blended – High and Low Scenarios, Memorandum, April 19, 2012

*2030 VMT estimates for this scenario represent the ridership build up phase which is estimated to be 55% of the full ridership.

Air travel diversions for a Phase 1 blended system and a Full Phase 1 system in 2030, 2035, and 2040 based on Business Plan scenarios are shown in Table 3:

Table 3 – Trip and Flight Diversions (Daily Air Trips Removed/Daily # of Flights)

Scenario	2030	2035	2040
High Scenario			
Phase 1 Blended	17,299 / 171	17,736 / 175	18,184 / 180
Low Scenario			
Phase 1 Blended	9,372 / 93	9,608 / 95	9,851 / 97

Source: Revised 2012 Business Plan, Ridership and Revenue Forecasting Final Technical Memorandum; GHG Analysis for Phase 1 Blended – High and Low Scenarios, Memorandum, April 19, 2012



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As compared to the Program EIR, which assumed the Full System (both Phase 1 and Phase 2) would be operational in 2030, automobile VMT reduction statewide under a Phase 1 Blended System would be about 43 percent of that described in the Program EIR. Air travel VMT reduction statewide would be about 40 percent of that described in the Program EIR.

BENEFITS FROM REDUCTION IN AIR POLLUTION AND GHG EMISSIONS

Based on Revised 2012 Business Plan ridership forecasts, benefits in terms of reduced GHG emissions would be lower in 2030 than described in the Program EIR. Whereas the Program EIR estimated a benefit of reduced GHG emissions of roughly 3.4 million metric tons annually in 2030, Business Plan assumptions would yield roughly 0.88 to 1.4 million metric tons in 2030; 0.85 to 1.4 million metric tons in 2035; and 0.87 to 1.4 million metric tons in 2040. (GHG Analysis for Phase 1 Blended – High and Low Scenarios, Memorandum, April 19, 2012.) Under the Business Plan assumptions, GHG benefits would be 25% to 42% of the 3.4 million metric tons annually described in the Program EIR in 2030.

BENEFITS FROM REDUCTION IN ENERGY USE

Based on scenarios in the Revised 2012 Business Plan, benefits in terms of reduced transportation energy use would be lower in 2030 than the benefits described in the Program EIR. Whereas the Program EIR estimated a benefit of 33,668,055 MMBtus annually, or the equivalent of 5.8 million barrels of oil, the Business Plan scenarios would yield energy benefits in the range of 11,674,900 -18,818,400 MMBtus annually in 2030, or the equivalent of 2.0 to 3.2 million barrels of oil saved. (GHG Analysis for Phase 1 Blended – High and Low Scenarios, Memorandum, April 19, 2012.)

III. OTHER BENEFITS DESCRIBED IN PROGRAM EIR AND REVISED 2012 BUSINESS PLAN

The Revised 2012 Business Plan includes an analysis that examines benefits and costs of a Phase 1 Blended System, following industry best practices set by the US Department of Transportation and the California Department of Transportation. Benefits identified in the Business Plan include:

- Travel time savings for HST riders
- Travel time savings for highway users
- Travel time savings for airline passengers
- Reliability in travel times
- Reductions in vehicle operating costs
- Increased productivity for HST riders
- Reduction in parking infrastructure needs
- Airline operator savings
- Improved transportation safety and reduced costs from accidents

The analysis concludes that the anticipated quantifiable benefits from the high-speed train system exceed anticipated costs, regardless of phasing or the high and low scenarios in the Revised 2012 Business Plan. (Revised 2012 Business Plan, chapter. 9; California High-Speed Rail Benefit-Cost Analysis



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Report.) These types of benefits are consistent with the travel time, reliability, safety, modal and geographic connectivity, and transportation cost benefits described in the Program EIR. (2008 Final Program EIR, chapters 1, 2, 3.1, 3.2.)

In addition, the Revised 2012 Business Plan includes updated employment information assuming a Phase 1 Blended System, developed in a phased pattern as described in the Business Plan. The first construction would create 100,000 job years of employment between 2013 and 2018. (Revised 2012 Business Plan, p. 9-11.) Constructing the Phase 1 Blended System would generate an additional 900,000 job-years of employment beyond the original 100,000, for a total of approximately 1 million job years. A Full Phase 1 System would provide a total 1.25 million job years of employment during construction. (Revised 2012 Business Plan, p. 9-12.) Once operational, the Phase 1 Blended System would directly employ about 2,900 people for operations and maintenance jobs. A Full Phase 1 system would directly employ about 3,500 people for operations and maintenance. (Revised 2012 Business Plan, p. 9-13.) These employment benefits are documented further in the Business Plan's Economic Impact Analysis Report, April 2012. As that report explains, different industry methods for calculating employment benefits from construction spending in the transportation sector can lead to different estimates. As compared to prior employment estimates in prior business plans, the Revised 2012 Business Plan confirms significant employment and economic benefits of the high-speed train.

IV. ENVIRONMENTAL AND ECONOMIC CONSEQUENCES OF NO HIGH-SPEED TRAIN

The 2005 Statewide Program EIR/EIS considered the environmental and economic costs of providing for the anticipated demand for transportation capacity in California through a high-speed train system, expanding airports and highways, or by doing nothing. The results of that evaluation concluded that the high-speed train was environmentally and economically superior. Additional work for the Revised 2012 Business Plan examined the related question of the economic costs of providing the same transportation capacity that the Phase 1 system would offer through expansion of freeways and airports. This analysis concluded that the high-speed train option would be less costly. (Comparison of Providing Equivalent Capacity to High-Speed Rail through Other Modes, April 2012.)

V. CONCLUSION

An important consideration is that the benefits discussed above are not the sole benefits of the high-speed train system. The 2012 Partially Revised Final Program EIR describes additional benefits in the areas of transportation connectivity, land use, safety, and social benefits. In addition, the environmental benefits discussed above, whether at the Program EIR levels or the Revised 2012 Business Plan levels, will continue to accrue annually, and will increase as the level of ridership on the HST system builds over time. The high-speed train provides for these benefits to continue for decades into the future.