



Air Resources Board



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TO: Dennis Trujillo
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California High Speed Rail Authority

FROM: Cynthia Marvin, Chief
Transportation and Toxics Division
Air Resources Board

DATE: August 13, 2014

SUBJECT: GREENHOUSE GAS REDUCTION FUND: HIGH SPEED RAIL
EXPENDITURE RECORD FOR FISCAL YEAR 2014-15

Thank you for submitting the final expenditure record (attached) on behalf of the High Speed Rail Authority (HSRA) on July 24, 2014, to satisfy the requirements of Senate Bill 1018 (Budget and Fiscal Review Committee, Chapter 39, Statutes of 2012) for expenditures from the Greenhouse Gas Reduction Fund (Fund). Air Resources Board (ARB) staff appreciates the iterative consultation process with HSRA staff on the development of this record to support expenditures from the Fund for High Speed Rail.

This memorandum documents that ARB staff concurred on July 24, 2014 that the HSRA record submitted on that date is consistent with the statutory requirements of Government Code Section 16428.9 and with ARB's expectations, as documented in both the July 22, 2014 internal draft ARB *Interim Guidance to Administering Agencies on Expenditure Record and Fiscal Procedures* and the August 6, 2014 final ARB *Interim Guidance to Administering Agencies on Expenditure Record and Fiscal Procedures* now posted on the ARB website.

The High Speed Rail Expenditure Record for Fiscal Year 2014-15, along with this memorandum, will be published on the ARB Cap-and-Trade Auction Proceeds website at: www.arb.ca.gov/auctionproceeds.

If you have any questions concerning this memorandum, please call me at (916) 324-0062 or via email at Cynthia.Marvin@arb.ca.gov.

Attachment

cc: See next page.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: <http://www.arb.ca.gov>.

California Environmental Protection Agency

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Greenhouse Gas Reduction Fund: High-Speed Rail Expenditure Record**Fiscal Year:** FY2014-15**Authorizing Legislation:** Item 2665-301-3228 (Senate Bill 852, Chapter 25, Statutes of 2014)

appropriated \$58,586,000 for High-Speed Rail System Planning – Acquisition and Design.

Item 2665-306-3228 (Senate Bill 852, Chapter 25, Statutes of 2014) appropriated \$191,414,000

for the High-Speed Rail Initial Operating Segment, Section 1 – Acquisition and Build.

Agency: California High-Speed Rail Authority (Authority or HSRA)**Intended Recipients:** Contractors, land owners, air district, local governments and/or non-profit organizations**Project Category:** High Speed Rail**Program Description:** Construction of the Central Valley initial operating segment and further environmental and design work on the statewide high-speed rail system.**(1) A description of each expenditure proposed to be made by the state agency pursuant to the appropriation.**

The FY2014-15 Budget appropriated a total of \$250 million in Greenhouse Gas Reduction Fund (GGRF) monies for high-speed rail. \$58.6 million of this FY2014-15 funding is targeted for Phase I project planning and design; and \$191.4 million is targeted for the Initial Operating Segment (IOS) Section 1 right of way acquisition and construction (and related capital costs, including but not limited to, environmental mitigation). The Budget allows the California High-Speed Rail Authority (Authority) to shift funds between these items with prior approval from the Department of Finance. In 2014, the Legislature also appropriated (SB 862), beginning in FY 2015-16, continuing funding for the high-speed rail project from the GGRF: \$400 million plus 25% of annual proceeds to the GGRF (per Sections 7 and 8 of SB 862) for Phase 1 (which includes all of the IOS) planning, design, right of way acquisition, loan repayment (for IOS capital costs incurred in the future) and construction and other capital costs. The appropriated GGRF funds will be used to leverage Federal funding on the IOS Section 1, and will be combined with other funds (e.g., from the State's Proposition 1A bonds) for expenditure on components of the IOS and the Phase I Blended System, as described in the Authority's 2012 Business Plan¹. The GGRF funds will be expended on environmental review and design costs, right-of-way acquisition, construction, environmental mitigation, and other capital costs.² The funds will be administered by the Authority.

The Authority is currently implementing planning, design and construction of the high-speed rail system IOS, and planning and preliminary design for the adjacent segments which, in total,

¹ California High-Speed Rail Authority; "California High Speed Rail Program Revised 2012 Business Plan", April 2012, adopted pursuant to Section 185033 of the Public Utilities Code;

http://www.hsr.ca.gov/docs/about/business_plans/BPlan_2012_rpt.pdf

² These expenditures will be made with the \$250 million appropriated in the FY2014-15 Budget, which is the focus of this part (1) of this expenditure record. The Authority expects to fund these types of expenditures, as well, in FY2015 and beyond using the GGRF monies appropriated in SB862, but anticipates preparing an updated expenditure record prior to FY 2015/16 to provide any updates.

comprise the Phase 1 Blended System. The IOS will provide high-speed passenger rail service from Merced to the San Fernando Valley. Ultimately, the system will provide high-quality, high-speed (up to 220 miles per hour) passenger rail service connecting California's major population centers. By 2029, the system will run from San Francisco to the Los Angeles basin in under three hours at speeds capable of exceeding 200 miles per hour.

(2) A description of how a proposed expenditure will further the regulatory purposes of Division 25.5 (commencing with Section 38500) of the Health and Safety Code, including, but not limited to, the limit established under Part 3 (commencing with Section 38550) and other applicable requirements of the law.

High-speed rail expenditures will reduce greenhouse gas emissions (GHGs) and further the purposes of AB 32 when people shift from cars and planes to high-speed rail. Both the 2013 Investment Plan³ and the AB 32 Scoping Plan⁴ recommend investments in high-speed rail and rail modernization to help achieve AB 32 goals.

AB 1532 (Pérez, Chapter 807, Statute of 2012) requires the development of a three-year Investment Plan which identifies priority investments that facilitate GHG reductions. This legislation also requires that GGRF moneys be appropriated in a manner that is consistent with the Investment Plan. The 2013 Investment Plan specifically recommends investments in rail modernization, including expanded transit, passenger rail, and high-speed rail service. Therefore, the high-speed rail expenditures covered by this record will be consistent with the three-year Investment Plan.

Provided below is additional information on how the expenditures will directly reduce GHGs.

Reduce GHGs by Shifting from Cars and Planes to High-Speed Rail

Initiation of high-speed rail service will reduce GHGs by shifting passengers from fossil-fueled cars and planes to electric rail service which will be powered by renewable energy. The Authority has forecast GHG reductions for the system in several environmental review documents⁵ and in a 2013 report to the Legislature, *"Contribution of the High-Speed Rail*

³ "Cap-and-Trade Auction Proceeds Investment Plan: Fiscal Years 2013-14 through 2015-16";

http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/final_investment_plan.pdf

⁴ Air Resources Board; AB 32 Scoping Plan; <http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>

⁵ The Authority has forecasted GHG reductions in the following Environmental Impact Reports (EIR) and Environmental Impact Statements (EIS): 2005, 2008, 2010 and 2012 Program EIR/EIS documents,

http://www.hsr.ca.gov/Programs/Environmental_Planning/EIR_EIS/index.html ;

2012 Merced-Fresno Project EIR/EIS,

http://www.hsr.ca.gov/Programs/Environmental_Planning/final_merced_fresno.html ;

2014 Fresno-Bakersfield Project EIR/EIS,

http://www.hsr.ca.gov/Programs/Environmental_Planning/final_fresno_bakersfield.html

Program to Reducing California's Greenhouse Gas Emission Levels"⁶. The report contains expected GHG reductions from operation of the IOS. The report also presents a range of activities under the high-speed rail program that directly reduce GHG emissions, as well as those parts of the program that will influence additional GHG reductions. The report details activities the Authority is undertaking that result in GHG emissions savings prior to 2020, including investment in Caltrain electrification and bookend and connectivity projects, construction requirements such as clean equipment and recycling, and mitigation such as the Voluntary Emissions Reduction Agreement.⁷ The Authority recently updated the range of GHG reduction estimates for consistency with the 2014 Business Plan ridership forecasts.⁸

Renewable Energy

The Authority is committed to running the high-speed rail system on 100 percent renewable energy. This approach furthers the purposes of AB 32. Net-zero energy operations can be achieved by procuring enough renewable energy to offset the amount of energy the system takes from the State's power grid to operate trains and facilities.⁹

Tree Planting Program

To offset GHG emissions from construction activities, the Authority is implementing a multi-faceted tree planting program to sequester an amount of GHG emissions equal to direct emissions produced in construction. The program, developed per the principles of ARB's 2011 *"Compliance Offset Protocol Urban Forest Projects"*¹⁰, would plant sufficient trees to sequester GHG emissions from construction of IOS Section 1. The Scoping Plan states that urban forest projects can provide the dual benefit of carbon sequestration and shading to reduce air conditioning load¹¹.

Other Activities that Mitigate GHG Emissions from Construction

The Authority has taken steps to minimize the emissions from construction through strict, binding requirements on its existing construction contractor, and continued and strengthened

⁶ High-Speed Rail Authority; "Contribution of the High-Speed Rail Program to Reducing California's Greenhouse Gas Emission Levels", June 2013;

http://www.hsr.ca.gov/docs/programs/green_practices/HSR_Reducing_CA_GHG_Emissions_2013.pdf

⁷ High-Speed Rail Authority; "GHG Timeline"; May 2014.

https://www.hsr.ca.gov/Programs/Green_Practices/index.html

⁸ High-Speed Rail Authority; "Preliminary Range of GHG Results based on 2014 Business Plan", June 2014;

https://www.hsr.ca.gov/Programs/Green_Practices/

⁹ High-Speed Rail Authority; "Renewable Energy Feasibility Memo", April 2014;

https://www.hsr.ca.gov/Programs/Green_Practices/operations.html

¹⁰ Air Resources Board; "Compliance Offset Protocol Urban Forest Projects", October 20, 2011;

<http://www.arb.ca.gov/regact/2010/capandtrade10/copurbanforestfin.pdf>

¹¹ Air Resources Board; AB 32 Scoping Plan; <http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>

those requirements for subsequent contractors and procurements¹². These requirements include the use of Tier IV or retrofitted equivalent off-road construction equipment, new, fuel-efficient on-road vehicles, and recycling of all concrete and steel from construction¹³, as well as at least 75% of all other non-hazardous construction waste. Collectively, these steps will result in minimizing direct greenhouse gas emissions from construction activities.¹⁴

(3) A description of how a proposed expenditure will contribute to achieving and maintaining greenhouse gas emission reductions pursuant to Division 25.5 (commencing with Section 38500) of the Health and Safety Code.

The expenditures for the high-speed rail system will support a long-term project (construction of which is presently underway) that will help California maintain and continue GHG reductions through 2050 and beyond. The Authority estimates that GHG reductions will start to be achieved when the IOS is completed in 2022. Ridership and GHG reductions are projected to grow annually, increasing as segments of the system are completed, and increasing over its 100-year design life.

High-speed rail service has been sustained and grown in countries such as Japan for the past 50 years, France for the past 33 years, and Germany and Spain for the past 22 years. Service in those countries grew and continues to grow based on initial and increasing demand, and operation at a profit. Similarly, HSRA analysis demonstrates that HSR ridership will grow and that HSR will continue to reduce GHG emissions for decades, as HSR operates over its 100-year expected life. Moreover, the passage of Senate Bill (SB) 852 (Chapter 25, Statute of 2014) and SB 862 (Chapter 836, Statute of 2014) authorized a long-term dedicated funding stream for high-speed rail infrastructure construction which assists with system development and facilitates project financing.

(4) A description of how the state agency considered the applicability and feasibility of other nongreenhouse gas reduction objectives of Division 25.5 (commencing with Section 38500) of the Health and Safety Code.

In addition to reducing GHG emissions, the high-speed rail system is expected to provide a variety of co-benefits, as described below. The high-speed rail system will connect the regions

¹² High-Speed Rail Authority; "Executed Agreement: Book 2, Part B: General Provisions. Section 44; RFP for Design-Build Services for Construction Packages 2-3:Book 1, Part B.2 – General Provisions. Section 44", July 2013.

¹³ The Air Resources Board has developed GHG emission reduction factors for recycling in the following document: "Method for Estimating Greenhouse Gas Emission Reductions from Recycling", November 14, 2011;

http://www.arb.ca.gov/cc/protocols/localgov/pubs/recycling_method.pdf

¹⁴ High-Speed Rail Authority; "GHG Timeline"; May 2014.

https://www.hsr.ca.gov/Programs/Green_Practices/index.html

of the state, contribute to economic development and a cleaner environment, create jobs and preserve agricultural and protected lands (2012 and 2014 Business Plans¹⁵).

Economic Co-Benefits

Construction of IOS Section 1 in the Central Valley (where construction has started) is expected to create up to 20,000 jobs annually for five years. As of June 2014, more than 6,800 people are working or have worked on the statewide high-speed rail program. This includes, but is not limited to, regional consultants doing environmental work and preliminary engineering, right-of-way teams doing survey and appraisal work, the design-build contractor (and its employees and sub-contractors and their employees) doing final design and construction, and utility relocation. In addition, the Authority has an aggressive Small Business program that required 30% of all contracts to include small business participation including Disadvantaged Business Enterprises (DBE), and Disabled Veteran Business Enterprises (DVBE). As of June 2014, the Authority has 168 unique small businesses committed to working on the statewide program.

Building and operating the high-speed rail system will directly employ thousands of Californians, while indirectly generating tens of thousands more jobs throughout the larger economy. Construction on the first segment between Madera and Kern County is projected to create thousands of jobs over the next five years. To ensure that these jobs benefit communities most in need, the Authority Board of Directors approved a Community Benefits Policy in 2012 with the goal of promoting the hiring of California community businesses and residents during construction and that supports employment of individuals who reside in Disadvantaged Areas and those designated as Disadvantaged Workers, including veterans.

Under the Community Benefits Policy, design-build construction contracts will be required to adhere to the National Targeted Hiring Initiative, which requires that at least 30% of all project work hours must be performed by a National Targeted Worker and at least 10% of National Targeted Workers hours must be performed by a disadvantaged worker. The jobs training that workers will receive through this policy will later permit workers to be employed on other construction projects, delivering benefits for a lifetime. Also, permanent jobs—train operators, maintenance yard workers, stations managers and others—will be created to operate and maintain the system. For example, according to the bottom-up estimate of the labor required in the O&M estimates to run the system, the IOS between Merced and the San Fernando Valley is expected to directly employ approximately 1,500 people full time in operations and maintenance.

¹⁵ California High-Speed Rail Authority; "Connecting California, 2014 Business Plan", April 30, 2014; http://www.hsr.ca.gov/docs/about/business_plans/BPlan_2014_Business_Plan_Final.pdf

Environmental and Public Health Co-Benefits

High-speed rail will reduce vehicle miles travelled (VMT) and air travel, thereby reducing criteria pollutants and improving air quality in the State. Localized pollutants such as particulate matter can be greater around freeways, which often have a greater percentage of disadvantaged communities adjacent; reduction in vehicles (and their emissions) on these freeways due to diversion of trips from auto to high-speed rail will benefit disadvantaged communities near these freeways. The 2014 Business Plan (Section 7) contains estimated reductions for criteria pollutants.

The tree planting program mentioned in item (2) is also designed to deliver co-benefits to Central Valley residents, including shading of playgrounds and public spaces, building shading and reduced energy use, air quality improvements, and reduced urban heat island effects. Disadvantaged communities will share in these co-benefits.

The Authority is also undertaking additional mitigation efforts that preserve agricultural land and maintain or restore habitat in contiguous parcels. These efforts will help achieve some of the non-greenhouse gas objectives of AB 32.

Other Co-Benefits

Connecting California population centers, and providing new mobility and accessibility to residents of the Central Valley will catalyze compact, transit oriented development and other development patterns that result in reductions in vehicle miles traveled (VMT) as well as less water and energy usage. The Authority is helping stimulate such development and associated benefits by the Authority's investments in updates to local land use plans and zoning codes and promotion of transit-oriented development around high-speed rail stations. As analyzed in the Vision California study, development scenarios that enable transit-oriented infill development achieve critical policy objectives of AB 32 and also have the potential to reduce millions more of tons of GHG emissions.¹⁶ Locating high-speed rail stations in existing downtown cores will assist with infill development, stimulate the local economy, reinforce SB 375 regional plans, and reduce the pressure on agricultural land.

In addition to the benefits noted above, the benefit-cost analysis completed for the 2014 Business Plan forecast a net benefit to the State as a result of high-speed rail service. In particular, the benefits that accrue from the system accrue both to users of the system through travel time savings and improved reliability, and to non-users through reduced auto and air congestion, fewer emissions, and fewer car crashes. Providing equivalent capacity to high-

¹⁶ Vision California; "Charting Our Future: Statewide Scenarios Report", May 2010.
https://www.hsr.ca.gov/docs/programs/green_practices/sustainability/Vision%20California%20-%20Statewide%20Scenarios%20report.pdf

speed rail through airport and road expansion would have significantly higher costs than building high-speed rail. In addition, the roadway and airport capacity that would be needed to provide mobility for California's projected population growth would result in higher GHG emissions per passenger-mile and lead to higher GHG emissions when compared to high-speed rail.¹⁷

(5) A description of how the state agency will document the result achieved from the expenditure to comply with Division 25.5 (commencing with Section 38500) of the Health and Safety Code.

Over the life of SB 852 and SB 862 expenditures from the GGRF, the Authority will provide regular updates on expenditures, project status, and benefits in reports prepared according to ARB guidelines. At a minimum, the reports will include expenditure amounts, current estimates of achieved (as applicable) and projected GHG emission reductions, and quantification of other applicable co-benefits. The Authority will work closely with ARB to refine GHG reduction methodologies and estimates, based on the best available data. Provided below is a summary of recent reports that document GHG reductions.

In 2013, the Authority provided a report to the Legislature on the contribution of high-speed rail service to reducing the State's GHG emissions¹⁸. For this report, the Authority followed a methodology based on the *Climate Registry General Reporting Protocol, Version 2.0*, as well as the best practice discussed in *Recommended Practice for Quantifying Greenhouse Gas Emissions from Transit*, APTA 2009.¹⁹

As detailed in the report, net GHG benefits result when the GHG reductions from decreased VMT and air travel are greater than the GHG emissions from power production to run the high-speed rail system. To estimate GHG reductions when people shift from cars and airplanes, the Authority used emission factors from the ARB's Mobile Source Emissions Inventory (EMFAC

¹⁷ High-Speed Rail Authority, "Comparison of Providing the Equivalent Capacity to High-Speed Rail through Other Modes", April 2012.

http://www.hsr.ca.gov/docs/about/business_plans/BPlan_2012CompareEquivalentCapacity.pdf

Intergovernmental Panel on Climate Change (IPCC); 5th Assessment Report, "Climate Change 2014: Mitigation of Climate Change", Chapter 8: Transport; http://report.mitigation2014.org/drafts/final-draft-postplenary/ipcc_wg3_ar5_final-draft_postplenary_chapter8.pdf

¹⁸ High-Speed Rail Authority; "Contribution of the High-Speed Rail Program to Reducing California's Greenhouse Gas Emission Levels", June 2013;

http://www.hsr.ca.gov/docs/programs/green_practices/HSR_Reducing_CA_GHG_Emissions_2013.pdf

¹⁹ Climate Registry; "General Reporting Protocol, Version 2.0", March 2013;

http://www.theclimateregistry.org/downloads/2013/03/TCR_GRP_Version_2.0.pdf

American Public Transportation Association, "Recommended Practice for Quantifying Greenhouse Gas Emissions from Transit", 2009.

<http://www.apta.com/resources/hottopics/sustainability/Documents/Quantifying-Greenhouse-Gas-Emissions-APTA-Recommended-Practices.pdf>

2011) for cars and from ARB's *California's 2000-2009: Greenhouse Gas Emissions Inventory Technical Support Document* for airplanes.

For the benefit cost analysis in the 2014 Business Plan, the Authority used the same methodologies, calculations, and emission factors as were used in the 2013 report to the Legislature. However, the Authority refined modelling of the system per suggestions from the Ridership Technical Advisory Panel and the Government Accountability Office. The 2014 ridership model resulted in an updated data set for VMT reduction and air trips reduced. Enhancements in operations analysis resulted in an updated forecast of energy use for the system.

In its Sustainability Policy (October 2013) the Authority discusses tracking of information to report against metrics, including but not limited to those referenced below, in accordance with industry standard and recognized GHG emissions reporting requirements. The Authority will track and report on the metrics listed below and other data as specified in ARB's guidelines. The Authority will use the following metrics to determine GHG reductions and illustrate how use of funds for high-speed rail supports AB 32 and SB 535 objectives:

- Vehicle miles travelled reduced from mode shift to high-speed rail.
- Air trips reduced from shift to high-speed rail.
- Trees planted, by type and location.
- Trees planted, by type and location, and resulting environmental benefits (KWh of energy saved, gallons of stormwater filtered) and dollar value.
- Construction equipment type, engine model year, fuel type and hours operated.
- Material delivery trips and employee travel trips for construction work, by vehicle type, model year, distance travelled, and fuel type.
- Tons of concrete and steel recycled.
- Tons of construction waste reused or recycled.
- KWh of renewable energy used, by type.
- Jobs created by geographic location.
- Percentage of small businesses under contract.
- VMT reduction or ridership increase from connectivity projects.

In addition to tracking GHG emissions and reductions, the Authority will use the metrics listed above, as applicable, to document the following environmental co-benefits from high-speed rail implementation:

- Tons of reactive organic gasses (ROG) reduced.
- Tons of carbon monoxide (CO) reduced.
- Tons of nitrogen oxides (NOx) reduced.
- Tons of sulfur oxides (SOx) reduced.
- Tons of particulate matter with a diameter of 10 microns or smaller (PM10) reduced.
- Tons of particulate matter with a diameter of 2.5 microns or smaller (PM2.5) reduced.