

California High-Speed Rail Authority

Fresno to Bakersfield *Section*

Draft Supplemental Environmental Impact Report/Environmental Impact Statement

Appendix 1-B
Benefits

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ACRONYMS AND ABBREVIATIONS

Authority	California High-Speed Rail Authority
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
EIR	environmental impact report
EIS	environmental impact statement
FRA	Federal Railroad Administration
HSR	high-speed rail
MT	metric tons
SR	State Route
UPRR	Union Pacific Railroad
VMT	vehicle miles traveled

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APPENDIX 1-B: BENEFITS

1-B-1 Purpose

This Appendix provides information regarding the potential environmental benefits associated with the long-term operation of the high-speed rail (HSR) project. The Appendix opens with a brief review of the original intent (Purpose and Need) of the HSR programmatic environmental impact report (EIR)/environmental impact statement (EIS), and the identified benefits of the greater HSR system through California. Once a generalized vision is expressed, benefits associated with the Initial Operating System are presented. This review guides the discussion of the focused Fresno to Bakersfield segment under examination in the Fresno to Bakersfield Section Final EIR/EIS (California High-Speed Rail Authority [Authority] and Federal Railroad Administration [FRA] 2014a) and the Fresno to Bakersfield Section Locally Generated Alternative (F-B LGA) Supplemental EIR/EIS.

The Appendix then focuses on the Fresno to Bakersfield Section and offers a historical review of benefits identified in the previous Fresno to Bakersfield Section Final EIR/EIS, as well as those benefits resultant from the 2014 Business Plan (Authority and FRA 2014b). This Appendix then provides a review of the key project benefit information from this F-B LGA Supplemental EIR/EIS, and the expected benefits inherent in the 2016 Business Plan (Authority and FRA 2016).

In order to provide some context and differentiation for the changes and levels of benefit in this HSR project, a comparison of the project description and other circumstances that have changed between the previous environmental documents and business plans is presented. These changes include such features as changes in project phasing, operational assumptions, and modifications that may alter the significance of environmental effect and/or benefit of project implementation.

This Appendix provides additional information on how those benefits may be lower for an undefined period of time than as described in the F-B LGA Supplemental EIR/EIS, based on scenarios and assumptions contained in the 2016 Business Plan, which was adopted by the Authority Board on May 1, 2016. This information is intended to reflect the potential range of outcomes for HSR project benefits in the future, and to make the information about the range of benefits available to inform the decision-making process.

This information is initially addressed in technical sections of the F-B LGA Supplemental EIR/EIS, and is summarized in this Appendix to isolate and amplify the beneficial outcomes associated with project development. This additional information does not constitute a change in the proposed HSR system, and does not identify new or more severe adverse environmental impacts, or changes to the discussion of adverse environmental impacts from the HSR 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 project-level analysis. This additional information is solely for the purpose of providing a comparison of the analysis provided in the 2014 Business Plan, the 2016 Business Plan, and the F-B LGA Supplemental EIR/EIS.

Benefits Associated with the High-Speed Rail System Through California

The HSR system will provide environmental, economic, and community benefits statewide and within specific regions. Improvements in mobility and travel time, reductions in vehicle miles traveled (VMT) and commensurate drops in emissions of greenhouse gases (GHGs) and criteria air pollutants, increased job creation both during construction and throughout operations, enhanced community planning leading to transit-oriented development and pedestrian scale communities, greater opportunities for walking and improved health outcomes are all benefits identified through the HSR planning and environmental documentation.

Operation of the first segment of the Phase 1 HSR system will remove the equivalent of 31,000 passenger cars off the highways per day according to the California High-Speed Rail Project Comparison of Providing the Equivalent Capacity to High-Speed Rail through Other Modes (Authority and FRA 2012a). Overall travel times for both vehicular and air travel are expected to be affected by the HSR operation. The HSR operation will present an alternative to

the needed expenditure of \$158 billion for new highway miles and airport infrastructure. VMT, an indicator of energy consumption, GHG emissions, and criteria air pollution generation, will be reduced from the diversion of travelers from passenger cars to rail.

Benefits to economic development and job creation will be accrued from the HSR project. Over 60,000 jobs annually are forecast during construction of the Phase 1 project over 15 years (Authority and FRA, 2016). Operation of the system will create more than 1,000 permanent jobs in each of the northern, central, and southern regions of the State. The \$2.6 billion initial state investment in HSR from Proposition 1A bond funds will produce a net economic impact of \$8.3 to \$8.8 billion (a 3:1 return). State and local governments will earn more than \$600 million back in tax revenue, or nearly 25 percent of what the state will spend on initial construction of the HSR system.

The implementation of HSR will have a beneficial effect on future community development around station sites and in proximity to intercity transit affected by HSR investment. Transit-oriented development will create denser community centers, leading to pedestrian scale planning. Provision of walkable and cycling infrastructure will reduce the demand for short-distance automobile travel and can spur economic development at the pedestrian level. The focus on transit-oriented development, complete streets, and walkable communities will have direct benefits to property values, community cohesion and healthy outcomes as described in Vision California (Authority and Calthorpe Associates 2010).

1-B-2 Environmental Benefits Described in Previous Documentation

The Fresno to Bakersfield Section Final EIR/EIS includes information on project benefits. The benefits include reduced VMT, reduced energy use for transportation, and reduced air pollution from transportation sources, including reduced emissions of GHGs (see Section 3.2, Transportation, and Section 3.3, Air Quality and Global Climate Change of the Fresno to Bakersfield Section Final EIR/EIS). These benefits were derived based on the assumption in the Fresno to Bakersfield Section Final EIR/EIS that the entire 800-mile system (Full System—both Phase 1 and 2) would be operational and serving 69 million riders (equivalent to HSR fares set at 83 percent of airfares) to 98 million riders (equivalent to HSR fares set at 50 percent of airfares) annually in 2035. The following summarizes the conclusions of specific benefits that were disclosed in the Fresno to Bakersfield Section Final EIR/EIS.

Benefits from a Reduction in Vehicle Miles Traveled

The Fresno to Bakersfield Section Final EIR/EIS concluded that the HSR project would divert automobile trips to HSR trips, thus reducing local and regional VMT. The Fresno to Bakersfield Section Final EIR/EIS identified a statewide VMT reduction of approximately 21 to 31 million miles daily with the implementation of a HSR project as compared to the No Project Alternative in 2035. The diversion from automobile to HSR was estimated to lead to a 7 to 10 percent statewide reduction in VMT on the state highway system. The reduction in both automobile and air travel VMT would provide benefits in the form of reduced congestion on both the state's highway system as well as at airports. Within the Fresno, Kings, Tulare, and Kern counties project area, the VMT reduction was estimated at 5.4 to 8.0 million miles daily.

Benefits from a Reduction in Air Pollution and Greenhouse Gas Emissions

It was disclosed in the Fresno to Bakersfield Section Final EIR/EIS that the HSR project would have a beneficial effect on (i.e., reduce) statewide emissions of applicable pollutants due to projected reductions of pollutants generated by vehicle and air travel. The analysis in the Final EIR/EIS included the estimated change in emissions due to projected reductions of on-road VMT and intrastate air travel, and increases in electrical demand (required to power the HSR). As compared to the No Project Alternative in 2035, all air pollution emissions analyzed (i.e., carbon monoxide, particulate matter smaller than or equal to 10 microns in diameter, particulate matter smaller than or equal to 2.5 microns in diameter, oxides of nitrogen, and volatile organic compounds) would be reduced.

The HSR project was included in Assembly Bill 32 scoping plan to help the State meet GHG emission reduction targets. The reduction in GHG emissions statewide was estimated to be approximately 2.5 million metric tons per year of carbon dioxide (CO₂) emissions for the HSR when compared to the 1.7 million metric tons per year of CO₂ emissions for the No Project Alternative.

Benefits from a Reduction in Energy Use

The Fresno to Bakersfield Section Final EIR/EIS showed how the new HSR travel mode would divert both automobile trips and air travel, resulting in less energy use for transportation. As compared to the No Project Alternative in 2035, the Fresno to Bakersfield Section Final EIR/EIS concluded that the HSR would reduce transportation energy consumption by 63,262 to 94,760 million British thermal units daily.

1-B-3 Environmental Benefits Based on Scenarios from Prior Business Plans

A business plan serves as an implementation strategy or “road map” for how construction of the HSR system is expected to proceed and is statutorily mandated. The previous plan included information about how construction of the different individual sections of the HSR system were to be phased, when different subsets of the entire system were to be operational, what level of ridership were expected at each phase, and what level of benefits were expected.

The draft 2014 Business Plan was an update of the Revised 2012 Business Plan (Authority and FRA, 2012b) that complied with the statutory requirements originally established for preparing a business plan every two years and addressed requirements established in Senate Bill 1029 (Budget Act of 2012). Like the 2012 plan, the 2014 plan continued to show that the program was financially viable and provided reductions in VMT, air pollution, GHG, and energy use.

1-B-4 Summary of Differences Between the May 2014 Project and the F-B LGA Project

As a result of the public review process and re-evaluation of alignments, an alternative to the May 2014 Project alignment and station location has been considered and now is reflected in the F-B LGA Project. While the alignment and station location are different, many of the attributes, impacts and benefits are similar between the two alternatives. A summary of the two alternatives is provided for context.

The May 2014 Project alignment runs primarily at-grade as it follows the BNSF Railway corridor and State Route (SR) 43 through Shafter and SR 58 into Bakersfield. The May 2014 Project parallels the F-B LGA until approximately Beech Avenue, where it diverges from the F-B LGA, parallels the BNSF Railway right-of-way in a southeasterly direction, and then curves back to the northeast to parallel the BNSF Railway tracks toward Kern Junction. After crossing Truxtun Avenue, the alignment curves to the southeast to rejoin the F-B LGA and parallel the Union Pacific Railroad (UPRR) tracks and Edison Highway to its terminus at Oswell Street. The May 2014 Project Station would be built at the corner of Truxtun and Union Avenues/SR 204.

The F-B LGA was identified in 2014 as a result of a Settlement Agreement between the city of Bakersfield and the Authority. The F-B LGA provides an alternative alignment between Poplar Avenue in Shafter to Oswell Street in Bakersfield, and would be located to the east of the May 2014 Project alignment. Similar to the May 2014 Project, the F-B LGA alignment would begin north of Shafter, continuing southeasterly until just north of Burbank Street where it would turn east until reaching the UPRR corridor. At this point, the alignment would turn and continue southeasterly, adjacent to and west of, the UPRR corridor. The alignment would continue southeasterly into Bakersfield and would deviate from the UPRR corridor. Southwest of the Oil Junction community, the alignment would cross SR 99 and continue southeast. South of Airport Drive, the alignment would cross and run parallel to the west side of SR 204. This route would continue until the SR 178 crossing, where the alignment would turn east and return parallel to the UPRR corridor. The F-B LGA would continue generally east within the Sumner Street and Edison Highway corridors and would terminate near Oswell Street. The F-Street Station would be located at the intersection of SR 204 and F Street.

The F-B LGA is a result of the Authority's work with local stakeholders to refine the HSR project to achieve positive outcomes for affected communities and the natural environment, while still meeting the overall project objectives consistent with the voter-approved Proposition 1A. The F-B LGA has been selected as the Preferred Alternative for the following reasons:

- The F-B LGA, when compared to the May 2014 Project, would reduce the number of residential displacements. The F-B LGA would require 86 residential displacements, while the May 2014 Project would require 384 residential displacements.
- The F-B LGA, when compared to the May 2014 Project, would result in similar business relocation impacts. The F-B LGA would require 392 business relocations, while the May 2014 Project would require 377 business relocations.
- The efficiency gained from the F-B LGA results in fewer direct permanent impacts on waters and wildlife resources. The F-B LGA would result in 15.96 acres of direct permanent impacts on waters, while the May 2014 Project would result in 16.52 acres of direct permanent impacts on waters. The F-B LGA would result in fewer direct permanent impacts to wildlife resources than the May 2014 Project.
- The F-B LGA, when compared to the May 2014 Project, would result in similar uses of Section 4(f) properties. Both the F-B LGA and the May 2014 Project would use two Section 4(f) properties.
- The F-B LGA, when compared to the May 2014 Project, would result in fewer permanent impacts to Important Farmlands. The F-B LGA would permanently impact 372 acres of Important Farmlands compared to 485 acres under the May 2014 Project. Additionally, the F-B LGA would impact 114 acres of Williamson Act Contract Lands compared to 47 acres under the May 2014 Project.

1-B-5 Environmental Benefits Described in the F-B LGA Supplemental Environmental Impact Report/Supplemental Environmental Impact Statement

As indicated in Section 3.3 of the F-B LGA Supplemental EIR/EIS, "Common benefits to regional air quality would come from a reduction of VMT and airplane emissions, which would reduce criteria pollutants, mobile source air toxics, and GHG emissions. Additionally, the project would have the common benefit of meeting a GHG reduction measure identified in the AB 32 scoping plan."

The F-B LGA Supplemental EIR/EIS Air Quality section analysis is based on the premise that the relocation of the Bakersfield station from Truxtun Avenue to F Street will not have appreciable regional effects on mobility and origin/destination linkages. While a small fraction of individual trips may result in differing trip durations (longer or shorter trips) as a result of the relocated station, the regional change is negligible. Regional shifts in mobility affecting air quality as a result of HSR are similar if not the same when comparing the May 2014 Project to the F-B LGA.

As such the F-B LGA Supplemental EIR/EIS Air Quality section analysis indicates that VMT benefits are the same as disclosed in the Fresno to Bakersfield Section Final EIR/EIS. The statewide VMT reduction of approximately 21 to 31 million miles daily disclosed in the Fresno to Bakersfield Section Final EIR/EIS will occur in the F-B LGA project implementation.

Similar benefits to GHG emissions and criteria pollutant emissions will be accrued under F-B LGA project implementation. The results presented in the Fresno to Bakersfield Supplemental Air Quality and Global Climate Change Technical Report indicate that all air pollution emissions analyzed for the F-B LGA (i.e., carbon monoxide, particulate matter smaller than or equal to 10 microns in diameter, particulate matter smaller than or equal to 2.5 microns in diameter, oxides of nitrogen, volatile organic compounds, and CO₂) will have a similar reduction and net regional and statewide benefits as previously disclosed for the May 2014 Project. The reduction in GHG emissions statewide estimated to be approximately 2.5 to 1.7 million metric tons per year of CO₂ emissions will occur for the F-B LGA project as well.

Implementation of the HSR, whether the May 2014 Project or the F-B LGA, will have measurable benefits to VMT, air pollution emissions, and GHG emissions. The changes to the project to arrive at a locally preferred station location will continue to have a similar level of benefit when comparing the May 2014 Project and the F-B LGA. These changes do not affect the enhancements accrued regionally and statewide.

1-B-6 Environmental Benefits Described in 2016 Business Plan

Environmental benefits described in the 2016 Business Plan and associated documentation include reducing GHG emissions and creating a more sustainable future even as the state grows to 50 million people. (Authority and FRA 2016)

By 2040, the HSR is anticipated to reduce VMT in the state of California by almost 10 million miles every day.

The reductions associated with riders on the initial Silicon Valley to Central Valley line are projected to start at almost 120,000 metric tons (MT) of carbon dioxide equivalent (CO₂e) in 2025. The extension of the line into San Francisco and Bakersfield by 2025 is projected to result in an additional savings of over 60,000 MT CO₂e. Average annual savings of the Phase 1 system through 2040 is projected to be just over 1 million MT CO₂e and through 2075 is projected to be 1.35 million MT CO₂e (Authority and FRA 2016).

Cumulatively, over 13 million MT CO₂e are projected to be reduced by 2040, 26 million MT CO₂e by 2050, and 63 million MT CO₂e by 2075 (Authority and FRA 2016).

In an effort to reduce emissions during construction, Tier IV construction equipment (including cranes, crawlers, and excavators), which meet the nation's most stringent environmental standards, have been deployed to help protect air quality and reduce GHG emissions (Authority and FRA 2016).

In addition, an agreement has been reached with the San Joaquin Valley Air Pollution Control District to offset criteria air pollutant emissions during construction by replacing aging farm and other equipment, including replacing school bus engines and irrigation pumps. As of April 2016, the Air District has offset 39 tons of pollution through the replacement of 30 pieces of farm equipment and trucks in addition to a school bus in the Central Valley.

As part of the commitment to the goal of running service using 100 percent renewable energy, the Authority Board will finalize a renewable energy policy and implementation plan. Collaboration with the renewable energy industry to contract for 400 to 600 megawatts of renewable energy to help power the Phase 1 system will continue.

The environmental benefits of the HSR system as compared to the previous 2014 plan are similar in that the overall system is anticipated to reduce statewide VMT and GHG emissions and improve air quality. The specific benefits attributed to the first HSR lines will be different from the 2014 Business Plan due to the prioritization of the Silicon Valley to Central Valley line over the Merced to the San Fernando Valley line. Passenger service is now projected to begin in 2025 rather than 2022.

1-B-7 Conclusion

The benefits discussed above are not the sole benefits of the HSR system. The Fresno to Bakersfield Section F-B LGA Supplemental EIR/EIS describes additional benefits in the areas of transportation connectivity, land use planning achievements, safety enhancements, and social advantages. In addition, the environmental benefits discussed above, the findings of the F-B LGA Supplemental EIR/EIS and the 2016 Business Plan levels indicate that regional and community enhancements and environmental benefits will in fact continue to accrue annually, and increase as the level of ridership on the HSR system builds over time. Construction of the HSR provides the opportunity for continuing benefits for decades into the future.

1-B-8 References

- California High-Speed Rail Authority (Authority) and Calthorpe Associates. 2010. Vision California, Charting Our Future: Statewide Scenarios Report. May 12, 2010.
- California High-Speed Rail Authority (Authority) and USDOT Federal Railroad Administration (FRA). 2012a. *California High-Speed Rail Project Comparison of Providing the Equivalent Capacity to High-Speed Rail through Other Modes*. Sacramento, CA, and Washington, D.C.: California High-Speed Rail Authority and U.S. Department of Transportation Federal Railroad Administration.
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