3.0 Affected Environment, Environmental Consequences, and Mitigation Measures

3.1 Introduction

This chapter addresses existing environmental conditions and the project's impacts on environmental resources, examining each resource in a separate subsection. FRA is preparing an EIS for the Fresno to Bakersfield Section of the HST project and the Authority is preparing an EIR under CEQA. CEQA guidelines encourage preparation of joint CEQA-NEPA documents and the use of an EIS to satisfy CEQA requirements where possible and appropriate. The Authority and FRA have used their best judgment in preparing this combined EIR/EIS to satisfy both CEQA and NEPA requirements.

NEPA requires the consideration of potential environmental impacts in the evaluation of any proposed federal agency action. NEPA also obligates federal agencies to consider the environmental consequences and costs in their projects and programs as part of the planning process. General NEPA procedures are set forth in the Council on Environmental Quality regulations (40 CFR 1500-1508). FRA implements NEPA through its Procedures for Considering Environmental Impacts (64 Federal Register 101, 28545).

CEQA (Section 21000 et seq.) and CEQA Guidelines (Section 15000 et seq.) require state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, when feasible. Public Resources Code Section 21100(b)(3) provides that an EIR shall include a statement setting forth the mitigation measures proposed to minimize the significant effects on the environment.

The requirements of NEPA and CEQA are not necessarily the same; similar requirements found in both statutes may have different levels of stringency, and some provisions that appear in one statute may not appear in the other. In addition, the proposed project is subject to federal and state environmental statutes and regulations that are separate from NEPA and CEQA but which require analyses that must be incorporated into the EIR/EIS. In circumstances where more than one regulation or statute might apply, this joint EIR/EIS has been prepared in compliance with the more stringent or inclusive set of requirements, whether federal or state.

The Authority and FRA have focused on avoiding and minimizing potential impacts through rigorous planning and thoughtful design. The project-level environmental analysis conducted for this EIR/EIS and described in this chapter includes consideration of means to avoid, minimize, and mitigate potential adverse environmental impacts. In balance with other considerations, the Authority has defined alignments along existing transportation corridors and rights-of-way to the extent feasible, while accommodating the appropriate features and design standards for the Fresno to Bakersfield Section of the HST project, to minimize overall impact potential. When necessary and appropriate, this chapter identifies site-specific mitigation for the HST project, including those specific to alternative alignments, stations, and the other facilities, such as the power conveyance and heavy maintenance facilities.

3.1.1 Chapter 3 Purpose and Content

This chapter consists of three sections—the Affected Environment, Environmental Consequences, and Mitigation Measures—for each resource topic. The first section describes existing environmental conditions in the areas that would be affected by the proposed Fresno to Bakersfield Section of the HST project and the No Project Alternative. This is followed by a discussion of potential environmental impacts associated with constructing and operating the HST

alternatives. The sections in this chapter then conclude with the identification of site-specific mitigation measures where impacts cannot be otherwise avoided or reduced through design.

The analyses address the impacts of the alternative alignments, stations, and other related HST facilities as described in Chapter 2, Alternatives. They also incorporate impacts associated with related infrastructure changes required to accommodate the HST alternatives, such as roadway and interchange modifications, utility relocation, and addition of power substations, and identify key differences among the impacts associated with the alternatives. This document analyzes mitigation, impacts resulting from mitigation, and feasibility of mitigation.

Analysts used many sources to prepare this document. Chapter 10, References/Sources Used in Document Preparation, lists these sources.

3.1.2 Organization of This Chapter

Chapter 3 presents each environmental resource topic in its own section, as follows:

- Section 3.2 Transportation*
- Section 3.3 Air Quality and Global Climate Change*
- Section 3.4 Noise and Vibration*
- Section 3.5 Electromagnetic Fields and Electromagnetic Interference
- Section 3.6 Public Utilities and Energy
- Section 3.7 Biological Resources and Wetlands*
- Section 3.8 Hydrology and Water Resources*
- Section 3.9 Geology, Soils, and Seismicity*
- Section 3.10 Hazardous Materials and Wastes*
- Section 3.11 Safety and Security
- Section 3.12 Socioeconomics, Communities, and Environmental Justice*
- Section 3.13 Station Planning, Land Use, and Development
- Section 3.14 Agricultural Lands
- Section 3.15 Parks, Recreation, and Open Space
- Section 3.16 Aesthetics and Visual Resources*
- Section 3.17 Cultural and Paleontological Resources*
- Section 3.18 Regional Growth
- Section 3.19 Cumulative Impacts

The asterisks in this list indicate sections supported by a technical report, which is posted on the Authority's website (http://www.cahighspeedrail.ca.gov/), and contains additional detailed analyses. In addition, technical appendices to several resource topics provide key information used in preparing the affected environment discussions. See the Table of Contents for a list of all technical appendices.

More About Schools

Analysis of schools in the project vicinity can be found in the following sections:

- 3.3, Air Quality and Global Climate Change
- 3.4, Noise and Vibration
- 3.5, Electromagnetic Fields and Electromagnetic Interference
- 3.10, Hazardous Materials and Wastes
- 3.11, Safety and Security
- 3.12, Socioeconomics, Communities, and Environmental Justice
- 3.13, Station Planning, Land Use, and Development
- 3.15, Parks, Recreation, and Open Space

3.1.3 Approach to the Analysis

In all sections, information is presented in the following geographic and project order: north to south for alignment alternatives and their corresponding station alternatives, followed by the Heavy Maintenance Facility (HMF) study alternatives. The alternative alignments considered for the Fresno to Bakersfield Section include five alternative alignments in the more rural area between Fresno and Bakersfield and two alternative alignments in Bakersfield. Any combination of these

alternatives could comprise the complete alignment from Fresno to Bakersfield, creating a total of 24 distinct alternative alignment combinations. All sections begin with discussion about a single alignment from Fresno to Bakersfield (the BNSF Alternative); then the additional alternatives that deviate from this alignment are presented, beginning in the north and proceeding to the south in the following order: Corcoran Elevated, Corcoran Bypass, Allensworth Bypass, Wasco-Shafter Bypass, and Bakersfield South.

The project vicinities used for description and illustration of affected environment and impacts center around the cities of Fresno, Hanford, Corcoran, Wasco, Shafter, and Bakersfield. Analysts use smaller geographic areas, such as around the HST stations, to demonstrate the design options within the Fresno to Bakersfield corridor at a more detailed scale. Each resource topic addressed in Chapter 3 includes the following sections:

Introduction. The introduction presents the reader with an overview to the topic and the critical issues and concerns considered in the analysis.

Laws, Regulations, and Orders. The laws, regulations, and orders discussion for each resource topic identifies the relevant regulatory framework, as well as other regulatory agency guidelines relevant to project approvals or decisions for that resource topic.

Methods of Evaluation of Impacts. This section describes the methods used to collect data and evaluate potential impacts. This includes the following:

- **Methods for Evaluating Impacts under NEPA.** Requirements which specify that project effects be evaluated based on the criteria of context and intensity.
- **CEQA Significance Criteria.** For each resource topic, analysts use significance criteria to identify when impacts are considered adverse and warrant mitigation measures to help reduce the magnitude and severity of these impacts. These criteria are largely based on CEQA guidelines, which generally describe when impacts would be considered *significant* or when there would be a *substantial*, or *potentially substantial*, adverse change in any of the physical conditions within the area affected by the project. Where possible, significance criteria use state or federal standards. For example, air quality significance criteria follow the state and federal ambient air quality standards; noise significance criteria use thresholds defined by the FRA. In other cases, for example the visual resources analysis, the significance criteria rely on guidelines and policies, assessment methodologies such as those used by the FRA and professional standards.
- **Study Area for Analysis.** The study area includes the area surrounding all project components and a buffer specific to each resource area. The project components include the HST right-of-way and associated facilities such as traction-power substations and switching and paralleling stations, as well as the shifts in roadway rights-of-way associated with those facilities—including overcrossings and interchanges—that would be

What Is the Project Study Area?

The Fresno to Bakersfield Section study area extends south from Fresno and north from Bakersfield. It extends east from the BNSF corridor and west from the UPRR corridor. The Fresno to Bakersfield Section crosses central Fresno County, northeastern Kings County, southwestern Tulare County, and northern Kern County.

modified or shifted to accommodate the HST project, as described in Chapter 2, Alternatives. The area of permanent effect would include the following:

- HST Right-of-Way – would typically vary between 100 and 120 feet for rural areas and as little as 60 feet in constrained areas such as downtown Fresno and Bakersfield.
- Traction-Power Substations – would each require a 30,000-square-foot (or 200-foot by 150-foot) site adjacent to the HST alignment.
- Switching and Paralleling Stations – switching stations each would need a site of approximately 9,600 square feet (generally 120 by 80 feet) and paralleling stations each would need a site of approximately 8,000 square feet (generally 100 by 80 feet) adjacent to the proposed HST.
- HST Stations – the stations and associated structures including parking are analyzed as city blocks.
- Heavy Maintenance Facility Alternatives – depending on the site, each HMF may be up to 154 acres and generally 10,560 feet long by 3,000 feet wide at the widest portion. Two access tracks would diverge from the through tracks (four tracks total) on either side of the HMF, requiring a 160-foot HST right-of-way along the access tracks.
- Project roadway modifications – would have varying right-of-way and distance from the HST right-of-way, as illustrated in Figure 3.1-1, and would include the following:

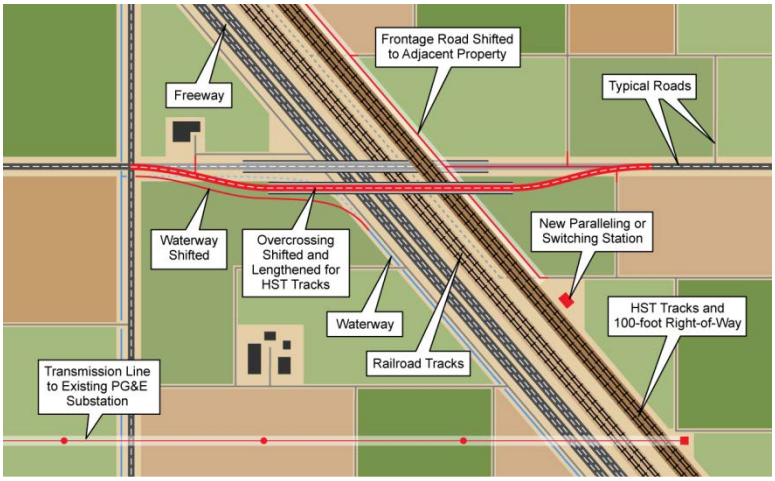

Figure 3.1-1
Shifts of roadways and other infrastructure

    - New two-lane overcrossings over the HST right-of-way.
    - Shift two-lane frontage roads (two to four lanes, with shoulders) that parallel the HST right-of-way.
    - Modification of an intersection on SR 43 and SR 137.

The HST project would require acquisition of property necessary for project operation (please see Appendix 3.1-A for parcel maps showing the temporary and permanent footprints of project alternatives). When the remnant portion of an acquired parcel beyond the right-of-way is too small to sustain current use without other modifications, it would also be acquired (as illustrated in Figure 3.1-2). These remnant parcels would not be used for construction and would be sold after project construction. The HMF sites would be considered for construction staging.

Affected Environment. The affected environment discussion summarizes the conditions in the project area that provide the basis for analysis of potential impacts on each environmental resource. Information in the affected environment discussion is presented for the entire Fresno to Bakersfield Section, including a discussion of the regional context. The affected environment discussions describe the existing conditions available in the most recent publicly available data or collected during field work in 2009, 2010, and 2011. Where appropriate and not overly speculative, the anticipated 2035 conditions that would pertain without the project are used as the No Project condition. Resource areas that discuss 2035 conditions include, for example, transportation and air quality, for which projected future conditions are defined in plans adopted by regional and local planning agencies.

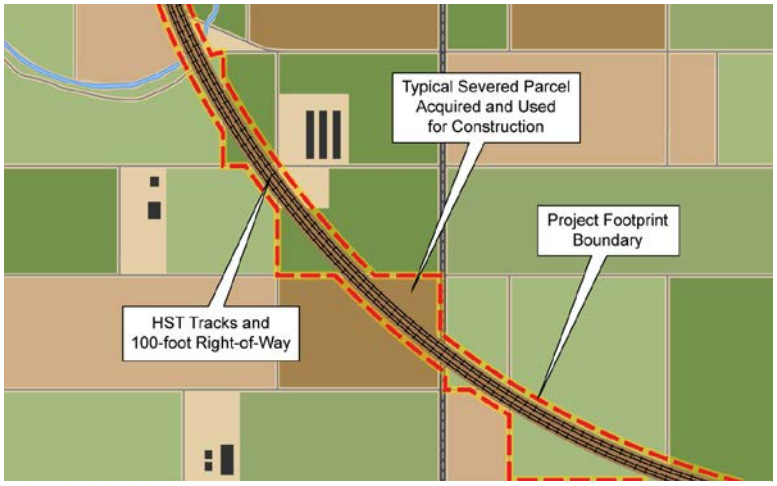

Figure 3.1-2
Parcels affected beyond project right-of-way

Environmental Consequences. The environmental consequences discussion describes the potential environmental impacts of the No Project Alternative and the HST alternatives. The Environmental Consequences section evaluates direct and indirect impacts[1] for the No Project and HST alternatives for the following periods:

- *Construction Period Impacts* – Temporary (short-term and long-term) impacts associated with the construction of the HST alternative. The construction period includes testing of the HST System prior to passenger service.
- *Project Impacts* – Permanent impacts related to the project operation and maintenance of the HST alternative. Project operations include HST System operations and related project improvements, such as roadway modifications, maintenance of power supply components, and maintenance of the HST, including the HMF site operations. Some permanent impacts initially occur during construction, but because they are permanent, they are associated with the project impacts (for example, conversion of agricultural lands to transportation uses).

The Environmental Consequences section includes a discussion of construction period and project impacts. The analyses assessed whether these impacts would have no effect, an adverse effect, or a beneficial effect on environmental resources:

- *No Effect* – The HST alternative would not alter the environmental status quo.
- *Adverse Effect* – The HST alternative would negatively affect the environmental resource value or quality as it exists prior to the project. These effects are qualified as negligible,

[1] Direct impacts are changes caused by and immediately related to the project. Indirect impacts are changes in the environment which are not immediately related to the project but which are caused indirectly by the project.

moderate, or substantial impacts under NEPA and less-than-significant or significant under CEQA.

- *Beneficial Effect* – The HST alternative would result in improvement of the environmental resource value or quality as it exists prior to the project.

Mitigation Measures. NEPA requires the identification of potentially adverse effects and appropriate mitigation measures to avoid or minimize such effects. CEQA requires that each significant impact of a project be identified and feasible mitigation measures be stated and implemented. For adverse construction period or project impacts identified in the Environmental Consequences section, the Mitigation Measures section identifies measures to avoid, minimize, rectify, reduce, eliminate, or compensate for significant adverse effects. (Also see Section 3.1.4 below.)

NEPA Impacts Summary. This section summarizes the environmental consequences specific to NEPA requirements and states whether the impact is beneficial, or adverse and negligible, moderate, or substantial. Residual adverse impacts after mitigation are described.

CEQA Significance Conclusions. This section lists the significant impacts identified in the Environmental Consequences section for each resource, identifies the level of significance prior to mitigation, and indicates which mitigation measures are available to reduce the level of each impact. If the measure's implementation would reduce the potential impact below the significance threshold, the impact would be considered less than significant after mitigation. If, however, the impact would remain above the significance threshold with the mitigation measure, the impact would be considered to be significant and unavoidable. This section identifies the level of significance after mitigation.

Cumulative Impacts. To understand fully a proposed project's environmental implications, CEQA and NEPA require that its effects be examined in conjunction with other past, present, and reasonably foreseeable projects. Section 3.19 discusses cumulative impacts for each resource.

3.1.4 The California High-Speed Rail Authority's Legal Authority to Cause Off-Site Mitigation to Occur

The rest of this Chapter 3 analyzes the project's potential physical environmental effects on various resource areas. If a potential significant effect is found, mitigation measures are proposed. Most of the measures are within the Authority's complete control. These include physical measures to be done within the project right-of-way (for example, sound walls adjacent to the track), physical modifications to the project design itself, and construction methods and techniques (the Authority will be able to require these of its construction contractors), among others.

Some of the proposed mitigation measures, however, would occur on property the Authority would not own as part of its right-of-way acquisitions. These are sometimes referred to as "off-site" mitigation. For example, the transportation analysis identifies various traffic improvement mitigation measures to occur in cities along the HST alignment. These measures include installing new traffic signals, modifying lane widths, and adding lanes and turn pockets. In most cases, these intersections are owned and controlled by the cities. Authority does not intend, and legally may not be able, to take ownership of these intersections so as to build the mitigation measure/improvement. The strong expectation is that the Authority and the cities will work together to allow the Authority to implement all the mitigation/improvements. It is possible, however, that a city might find undesirable a particular traffic improvement. As a result, it is theoretically possible that some of the project's traffic impacts could go unmitigated (i.e., result in a significant and unavoidable impact). Of course, this is highly unlikely, as cities almost

invariably would prefer a traffic improvement over traffic congestion. In addition, this in no way would undermine the Authority's commitment to the mitigation (including funding it), once adopted. This merely notes that the Authority may not be able to guarantee all traffic mitigation. The Authority intends to work with local cities prior to the Final EIR/EIS to confirm that all traffic mitigation is acceptable to them.

Another "off-site" mitigation is the purchase of agricultural easements to mitigate for the project footprint's conversion of farmland to HST uses. The Authority fully hopes to find enough owners of farmland willing to sell agricultural easements to meet the full mitigation. Given the number of acres, however, this may not be possible. It is highly uncertain whether the Authority legally can condemn agricultural easements from unwilling sellers. The Authority also is legally precluded from paying more than market price to purchase easements. Accordingly, while unlikely, it is possible that the Authority will not be able to implement the full extent of the mitigation. Again, this in no way would undermine the Authority's commitment to the mitigation, once adopted. This merely notes that the Authority may not be able to guarantee all of it, potentially leaving the project's impact to agricultural land significant and unavoidable, but only to the extent easements purchased fall short of the 1:1 ratio.

Other "offsite" mitigation could result in the same—albeit unlikely—outcome. These include noise insulation at personal residences, shielding of sensitive equipment at a hospital, shielding of UPRR and BNSF signaling systems, and new plantings (for visual screening) outside of the HST right-of-way. The Authority cannot force the property owners to accept, although it is highly unlikely that they would not.

3.1.5 Ridership and Environmental Impact Analysis

As discussed in Chapter 2, new ridership forecasts were developed for the statewide high-speed train system to support project-level environmental analysis. A “high” ridership forecast and a “low” ridership forecast were developed for the year 2035, when the system is expected to be fully constructed and approaching a mature state. The high forecast is based on assumptions of high-speed rail ticket prices being 50% of the cost of airfare. The low forecast is based on assumptions of high-speed rail ticket prices being 83% of the cost of airfare. The high forecast was used for the EIR/EIS analysis. Most of the topics in Chapter 3 involve the same impact, however, regardless of the level of ridership. Agricultural land impacts and impacts to biological resources, for example, relate to the footprint of the HST facilities, which generally would remain the same (i.e., same length and width of track, same structures, etc.) regardless of ridership. Other similar topics/resource areas include hydrology and water resources, geology and seismicity, safety and security, parks and recreation, aesthetics and cultural resources.

Other topics may have different levels of impact, depending on assumptions about the level of future high-speed rail ridership. To conservatively estimate adverse environmental impacts from operating the high-speed train system, this EIR/EIS uses the high forecast in 2035 in the areas of traffic (station area traffic congestion), noise and vibration (noise and vibration from train operations), air quality (localized air emissions tied to localized traffic), and energy use to power the high-speed trains. Use of the high forecast provides a representative worst-case scenario, and ensures that the maximum potential adverse environmental impacts from operating the high-speed train are identified. If ridership on the high-speed train system is lower, these adverse environmental impacts will be lower.

This EIR/EIS has also used the high forecast to identify environmental benefits of the high-speed train in 2035 in the areas of traffic (reduced vehicle miles traveled on intercity highways), air quality (reduced greenhouse gas emissions and reduced regional air pollution), and energy (reduced fossil fuel energy use due to reduced auto and plane use). If ridership on the HST System is lower, these environmental benefits will be lower as well.

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