

3.19 Cumulative Impacts

This section presents an analysis of the cumulative effects of implementing the project in combination with other past, present, and reasonably foreseeable future projects that may result in environmental impacts. The focus of this cumulative impacts analysis is on the Merced to Fresno Section of the HST System and the regional context appropriate for each resource area. For a discussion of the impacts of implementing the California HST System in its entirety, see the Statewide Program EIR/EIS (Authority and FRA 2005). For a discussion of the impacts of implementing the HST System in the San Francisco Bay Area to Central Valley region, see the Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008) and the Bay Area to Central Valley HST Revised Final Program EIR (Authority and FRA 2010). The cumulative impacts of the HST System as a whole are summarized under each resource topic below.

3.19.1 Introduction

3.19.1.1 Laws, Regulations, and Orders

National Environmental Policy Act

Under NEPA, a cumulative impact is the impact on the environment that results from the combination of incremental impacts of the action and other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal), entity, or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time (40 CFR 1508.7). A cumulative impact includes the combined effect on a natural resource, ecosystem, or human community that is attributable to past, present, or reasonably foreseeable future activities or actions of federal, nonfederal, public, and private entities. Cumulative impacts may include the effects of natural processes and events, depending on the specific resource. Accordingly, there may be different levels of cumulative impacts on different environmental resources.

California Environmental Quality Act

Under CEQA, an EIR must discuss cumulative impacts of a project when the project's incremental effect is "cumulatively considerable." Cumulatively considerable means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

Cumulative impacts are defined as two or more individual effects which, when considered together, are considerable or compound, or increase other environmental impacts. The cumulative impact of several projects is the change in the environment that results from the incremental impacts of each project in combination with other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from the combination of individually minor but collectively significant projects over a period of time (State CEQA Guidelines Section 15355).

3.19.1.2 Methods

The following steps helped determine the project's contribution to cumulative impacts, if any, for each resource:

- Review the impacts of the proposed project for each resource area. In those instances where the project would have a beneficial effect, consider this in conjunction with any adverse effects to the resource and proposed mitigation.
- Compile a list and description, as well as environmental impact information for past, present, and reasonably foreseeable projects and relevant plans for consideration of cumulative impacts. Check for such projects in regional transportation plans (RTP); regional transportation improvement plans (RTIP); local long-range transportation plans; local land use, general, and specific plans; interviews

with local and regional planning agencies; and recent environmental documents for other large-scale projects near HST alternatives.

- Reasonably foreseeable future projects are those that are likely to occur and will add to the cumulative impact on a particular resource. Generally, projects are reasonably foreseeable under the following conditions:
 - Applications for project entitlements or construction are pending with a government agency.
 - The project is included in an agency's budget or capital improvement program.
 - The project is a foreseeable future phase of an existing project.
 - The project would likely occur within the 2035 planning horizon for the HST project.
- Define the study area for the cumulative effects for each resource area.
- Identify the resource areas where the proposed project and projects that are occurring or reasonably foreseeable to occur could, together, cause a cumulative effect.
- Determine whether the proposed project's incremental contribution to the cumulative impacts for each resource area is cumulatively considerable.
- Identify reasonable, feasible options for avoiding or mitigating the project's contribution to significant cumulative impacts.

3.19.2 Cumulative Projects and Growth Forecasts

This section discusses the historical context of the study area and how development trends in the past have influenced the environmental character of the study area. This section also discusses projected development trends and describes how future urbanization will change the character of the study area to the year 2035. The cumulative project list (see Section 3.19.2.C) includes projects identified in municipal capital improvement programs and other long-range plans or in the permitting/entitlement process.

3.19.2.1 Historical Context of Project Area

Section 3.16, Cultural and Paleontological Resources, provides an overview of the history of cultural development in Merced, Madera, and Fresno counties from the Spanish Period (1769 to 1822) through the Gold Rush period and the development of railroads that brought new settlers to this area. The development of irrigation transformed the region into what is often referred to as the "Food Basket of America." The state highway system started in the early 1900s and continues to influence development in the region. SR 99 parallels the Merced to Fresno Section of the California HST System. SR 99 provided a four-lane expressway between Sacramento and Los Angeles in the 1950s. I-5, the second major north-south freeway through the Central Valley, was completed in the 1970s and is farther to the west.

3.19.2.2 Projected Growth Trends

As discussed in Chapter 2 under the No Project Alternative, projections show that the San Joaquin Valley will grow at a higher rate than any other region in California. Projections also show that Merced, Madera, and Fresno counties will continue to grow an average of 3% per year. By 2035, the study area will grow from a population of 1,366,000 to 2,298,000, which is a net increase of 932,000 people, or 68%. This increase could result in approximately 93,200 acres in new development to support the increased population. Accommodating this new population will require land and the construction of new roadways, electric power generation facilities, utilities, schools, and hospitals, and commercial and industrial facilities. The combined environmental influence of these future changes is referred to as the "cumulative condition" for 2035.

The cumulative project list discussed in the following section identifies the known projects that will become a part of the cumulative condition.

3.19.2.3 Cumulative Project List

Appendix 3.19-A provides detailed information about the reasonably foreseeable development projects and plans, and Appendix 3.19-B provides similarly detailed information about transportation projects considered in the cumulative condition. These lists include projects that will accommodate the 2035 study area population. The lists represent a small number of the projects that likely will be constructed within the study area from now through 2035. This is because permits and other entitlements required for the approval of private projects generally present only a snapshot of development activity over the next 3 or 4 years, although this timeframe may expand somewhat because of construction delays caused by the recent recession.

Section 3.18, Regional Growth, describes induced growth and indirect effects from growth; that section also identifies cumulative impacts associated with future projects and regional growth.

Major Foreseeable Projects

Tables 3.19-1 through 3.19-6 list major capital or new development projects by jurisdiction for the study area counties and cities. The tables include mixed-use developments planned for the near term and general plan updates to accommodate long-term development and urbanization, including the conversion of agricultural land anticipated to occur with the growth in population.

Table 3.19-7 lists the transportation improvement projects on SR 99 that are contained within the Merced, Madera, and Fresno County regional transportation plans. The project lists in Appendix 3.19-B also include more than 180 additional roadway improvements elsewhere within the region, ranging from restriping roads to creating additional lanes and interchange and capacity expansions. The amount of environmental information varies for these projects; however, all of these projects require environmental approvals.

Table 3.19-1
Merced County Major Foreseeable Projects

Project	Potential Cumulative Effect
George Reed Inc. Merced Quarry Project – 103-acre mine	• Conversion of agricultural land • Air quality • Hazardous waste • Noise • Truck traffic • Visual • Water resources • Wildlife habitat
Jaxon Enterprises – 6 million tons of aggregate by expanding existing mine	• Conversion of agricultural land • Air quality • Groundwater levels • Wildlife – vernal pools and habitat
Joe Lourenco Dairy – increase to 1,700 animals	• Air quality • Land use (inconsistent with goals) • Potential groundwater • Odor

Project	Potential Cumulative Effect
Los Banos Bypass – four-lane freeway bypass on a new alignment	• Conversion of agricultural land • Affects two potential hazardous waste sites • Noise • Wetlands • Wildlife habitat
Merced Enterprise Zone – replaces expired enterprise zone program	• Air quality
Red Rock Dairy – dairy with 5,636 animals	• Air quality • Potential groundwater • Odor
Santa Fe Aggregates – surface mine and reclamation plant	• Air quality • Land use (inconsistent with goals) • Noise • Truck traffic
Two freight rail extension projects (double track) to improve capacity and operations)	• Linear construction impacts through all land uses • Increased demand for construction materials and workers • Operational impacts are generally unknown
Yosemite Ranch Estates – 287 new single-family homes	• Conversion of agricultural land • Air quality • Land use • Noise • Visual • Water resources

Table 3.19-2
City of Merced Major Foreseeable Projects

Project	Potential Cumulative Effect
Bellevue Ranch – approximately 7,000 single-family and multifamily residential development	• Conversion of agricultural land • Greenhouse gas emissions • Traffic • Visual changes
Merced Wastewater Treatment Plant – upgrade to 20 million gallons per day	• Conversion of agricultural land • Surface water quality
Mercy Medical Center – 8-story, 607,000-square-foot facility	• Conversion of agricultural land • Greenhouse gas emissions • Operational traffic noise • Visual changes
Transportation projects – 21 intersection and roadway expansion projects to accommodate increased traffic; 2 freight railway extension (double track) projects to improve capacity and operations	• Linear construction impacts through all land uses • Increased demand for construction materials and workers • Operational impacts are generally unknown
Wal-Mart Distribution Center – 1.1-million-square-foot commercial facility	• Conversion of agricultural land • Greenhouse gas emissions • Traffic • Visual changes

Table 3.19-3
Madera County Major Foreseeable Projects

Project	Cumulative Effect
Austin Quarry – 2.5-million-ton hard rock quarry	• Agricultural land • Air quality • Noise
Fairmead Specific Plan – refine general plan to increase 1,700 residential units, decrease agricultural acreage, and increase commercial acreage	• Agricultural land • Air quality • Traffic • Visual
Gateway Village – mixed-use development with 5,836 residential units	• Uses agricultural land • Traffic • Noise • Wildlife habitat
Gunner Ranch West Specific Plan – development with 2,840 residential units and 3.9 million square feet of commercial area	• Air quality • Traffic
Hildreth Creek Quarry – 3-million-ton hard rock quarry	• Agricultural land • Air quality • Noise
Liberty Groves Specific Plan – master planned community for 7,500 residential units and 4.4 million square feet of commercial development on 1,433 acres	• Agricultural land • Air quality • Traffic • Visual
Madera County Dairy Standards – assists the dairy industry	• Air quality • Historical resources • Traffic • Wetlands • Wildlife habitat
Madera Ranch Quarry – 900,000-ton hard rock quarry	• Air quality • Noise • Truck traffic
Morgan Specific Plan – 700 residential units	• Air quality • Noise • Traffic • Visual • Wildlife habitat
North Shore at Millerton Lake – mixed-use development of 2,966 residential units and 1.5 million square feet of commercial	• Use of nonprime agricultural land • Air quality • Floodplain impacts • Visual • Groundwater • T&E species impacts
Raymond Area Plan – refine county general plan to increase the number of residential units and decrease agricultural land by 5,600 acres	• Agricultural land • Air quality • Traffic • Visual

Project	Cumulative Effect
San Joaquin River Ranch Specific Plan – 21,954 residential units and supporting commercial and industrial land uses	• Air quality • Noise • Traffic • Visual • Wildlife habitat
Shaw Specific Plan – 996 residential units	• Air quality • Noise • Traffic • Visual • Wildlife habitat
Sierra Meadows – 315 single-family residential units	• Air quality • Visual
Tatham Specific Plan – 9,040 residential units and supporting commercial uses	• Air quality • Noise • Traffic • Visual • Wildlife habitat
Tesoro Viejo Specific Plan – mixed-use development with 5,190 residential units	• Air quality • Cultural resources • Transportation
Tra Vigne Specific Plan – 432 residential units	• Agricultural land
Transportation projects – 45 intersection and roadway expansion projects to accommodate increased use and 1 freight railway project to provide a segment of double track to improve capacity and operations	• Linear construction impacts through all land uses • Increased demand for construction materials and workers • Operational impacts generally unknown

Table 3.19-4
City of Chowchilla Major Foreseeable Projects

Project	Cumulative Effect
Chowchilla General Plan Update	• Allows conversion of agricultural land • Land use – conflicts with Madera County General Plan • Utilities – solid waste capacity will be exceeded • Sensitive wildlife habitat lost
Rancho Calera – 2,042 homes and 495,000 square feet of commercial on 576 acres	• Air quality • Traffic • Wildlife habitat
Water well and pipeline to water treatment plant – increase municipal water supply	• Unknown

Table 3.19-5
City of Madera Major Foreseeable Projects

Project	Cumulative Effect
Fox Grove Retail Center – 180,000 square feet of retail development	• Traffic
Madera General Plan Update	• Allows conversion of agricultural land • Air quality • Land use – inconsistent with previous plans • Noise • Traffic increases • Visual change • Potable water demand • Wildlife habitat will be lost
Southeast Madera Development – 1,375 single-family residential units and 81,675 square feet of commercial on 376 acres	• Conversion of agricultural land • Air quality • Visual change • Traffic • Potable water demand
Town Center – 850,000 square feet of new commercial development	• Uses agricultural land • Air quality • Visual change • Traffic • Potable water demand

Table 3.19-6
City of Fresno Major Foreseeable Projects

Project	Cumulative Effect
El Paseo – 238-acre, mixed-use development	• Conversion of agricultural land • Air quality • Visual change • Traffic • Impact on potable water demand
Fresno General Plan Update 2025	• Allows conversion of agricultural land • Air quality • Noise • Traffic increases • Visual change • Potable water demand • Wildlife habitat
Transportation projects – 96 intersection and roadway expansion projects to accommodate increased demand	• Linear construction impacts through all land uses • Increased demand for construction materials and workers • Operational impacts generally unknown
Westlake Development – 460-acre, mixed-use development	• Conversion of agricultural land • Air quality • Visual change • Traffic • Potable water demand

Project	Cumulative Effect
Roeding Regional Park and Fresno Chaffee Zoo Facilities Master Plan	• Cultural resources impacts • Traffic • Noise

Table 3.19-7
SR 99 Transportation Improvement Projects

Project	Description
Financially Constrained	
<i>Merced County RTP</i>	
SR 99/140 Interchange	• Reconstruct interchange
SR 99 - Mission Freeway	• 4-lane freeway to 6-lane freeway and reconstruct interchange at Mission Ave
SR 99 - South of Livingston Freeway	• 4-lane freeway to 6-lane freeway and reconstruct interchange at Sultana Dr
SR 99 - North of Atwater Freeway	• 4-lane freeway to 6-lane freeway and reconstruct interchange at Westside Blvd
SR 99 - Arboleda Freeway	• 4-lane freeway to 6-lane freeway and construct interchange at Arboleda Dr
SR 99 - Plainsburg Freeway	• 4-lane freeway to 6-lane freeway and construct interchange at Plainsburg Rd
SR 99 – Livingston to Delhi	• 4-lane freeway to 6-lane freeway from Livingston to Delhi
<i>Madera County RTP</i>	
SR 99/SR 145 Interchange	• Reconstruct interchange
SR 99 - Ashlan Ave in Fresno County to Ave 7	• 4-lane freeway to 6-lane freeway
SR 99 - Ave 12 Interchange	• Reconstruct interchange
SR 99 - Ave 12 to Ellis Ave	• 4-lane freeway to 6-lane freeway and reconstruct interchange at Ellis Ave
SR 99 - Ave 7 to Ave 12	• 4-lane freeway to 6-lane freeway
SR 99 - Ellis Ave to Ave 17	• 4-lane freeway to 6-lane freeway and reconstruct interchange at Ave 17
SR 99 - SR 233 Interchange	• Reconstruct interchange
SR 99 - SR 152 Interchange	• New interchange and rail crossing
SR 99 - SR 152 to Merced County Line	• 4-lane freeway to 6-lane freeway and reconstruct interchange at Avenue 24
<i>Fresno County RTP</i>	
SR 99 - Central and Chestnut Interchange	• Upgrade interchange
SR 99 - Broadway to Golden State	• Update closed bridge structure
SR 99 - Fresno to Clinton	• Add northbound and southbound auxiliary lanes

Project	Description
SR 99 - Ashlan to Madera County line	4-lane freeway to 6-lane freeway
SR 99 - Interchange at Grantland Diagonal	Construct interchange
SR 99 - Interchange at Shaw	Improve interchange
SR 99 - Jensen to Bullard	6-lane freeway to 8-lane freeway
SR 99 - Jensen to Central	6-lane freeway to 8-lane freeway
SR 99 and Cedar/North Ave	Upgrade interchange
Unfunded	
<i>Merced County RTP</i>	
SR 99 Merced Freeway	4-lane freeway to 6-lane freeway
SR 99 Merced-Atwater Freeway	4-lane freeway to 6-lane freeway
SR 99 Atwater Freeway	4-lane freeway to 6-lane freeway
Sources: Merced County Association of Governments Regional Transportation Plan (2007); Madera County 2006 Regional Transportation Plan, Madera County Transportation Commission (2007); Fresno Council of Governments Regional Transportation Plan (2007)	

3.19.3 Analysis of Cumulative Impacts

The cumulative impacts discussion for each resource area considers the resource-specific study area, the condition of the resource, cumulative effects without the project, effects caused by the HST alternatives, and the cumulative effects of the project for each HST alternative. The No Project Alternative combined with the project list (reasonably foreseeable projects) is considered the cumulative condition, and the HST alternative would contribute additional impacts to the cumulative condition.

3.19.3.1 No Project Alternative

Projected growth and conversion of land to urban uses associated with the No Project Alternative is anticipated to have a greater environmental effect in the study area over the 2010 to 2035 planning period than the HST alternatives. Populations of Merced, Madera, and Fresno counties are projected to increase by 80%, 104%, and 59%, respectively, between 2010 and 2035. Housing and infrastructure associated with this increase will result in 93,000 acres of new land development (see Section 2.4.1 for rationale). The San Joaquin Valley Blueprint Roadmap (Mintier Harnish et al. 2010) calls for planning in the region to adopt smart growth principles, such as strengthening and directing development toward existing communities, that will focus growth in urban areas and population centers.

Nevertheless, urban development will continue to result in the conversion of agricultural land, especially for housing and associated developments. Under the No Project Alternative, traffic will increase; ambient noise levels will increase; the demand for energy and water will increase; habitat for wildlife will become less available; the amount of impervious surfaces will increase and affect the quality and amount of stormwater runoff; demand for public facilities and parks will increase; the land available for agricultural production will decrease; and the visual character of many locations in the study area will change from rural to urban. Growth is projected to result in an increase of employment by 332,721 jobs, which will create additional economic opportunities in the study area (see Chapter 2, Table 2-4).

3.19.3.2 High-Speed Train Alternatives

This section compares the cumulative effects of the three HST alternatives. In most cases, the HST alternatives contribute only a small incremental impact over the past, present, and reasonably foreseeable project impacts and the cumulative condition associated with the No Project Alternative. As analyzed in Section 3.18, Regional Growth, the project would result in a 3% population increase and 4% employment increase in comparison to the cumulative condition under the No Project Alternative. Over the 25-year planning horizon, these increments are cumulatively considerable in some areas and provide beneficial effects in others. However, compared to the cumulative condition of the No Project Alternative, the project would potentially improve the future environmental condition because of the benefits afforded by TOD, reduced automobile travel, reduced air pollutant emissions, and the economic activity generated.

At this level of analysis, the differences in the cumulative impacts under the three HST alternatives are minor, with no apparent discriminators among the alternatives. As such, the cumulative analysis considers the environmental condition of the study area with and without the project and its cumulative effect with other past, present, and reasonably foreseeable projects.

Transportation

The No Project and HST alternative study area for the transportation cumulative analysis includes Fresno, Madera, and Merced counties.

Construction

Construction effects may compound if SR 99 expansion projects occur at the same time as the HST Project and may contribute to incrementally more delays in traffic and detours for travel within the region. Coordination and, to some degree, construction phasing would minimize these temporary effects, resulting in cumulative impacts that are negligible under NEPA and not cumulatively considerable under CEQA.

Short- and Long-Term Operations

Because the transportation analysis is regional, the cumulative transportation impacts already include the cumulative impacts presented in Section 3.2, Transportation. The No Project Alternative will result in approximately 50 million VMT daily in the study area by 2035. Implementation of any of the three HST alternatives is expected to result in a combined reduction in VMT of 7.0% for Merced, Madera, and Fresno counties. Highway improvements planned in the study area will not reduce daily VMT but will help to reduce future congestion in some areas. Cumulatively, the HST alternatives and highway improvements would reduce congestion, reduce travel delays, and stimulate economic growth as a result of improvements in mobility for the study area population. Offering a broad range of transportation modes improves accessibility to the state's urban centers in the Central Valley beyond what would occur by only widening freeways, because HSTs offer a more reliable and safe mode of travel. Locally, the project would contribute to traffic in the HST station areas; however, only slight changes would be experienced with mitigation. As a result of reduced congestion and delay, and improved mobility and access, cumulative transportation impacts would be beneficial.

As described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008), implementation of the HST System as a whole could benefit intercity highways. The HST System could also have a significant impact on local traffic conditions near some HST stations, such as the Transbay Transit Center (San Francisco to San Jose Section) and Buena Vista Station Area (Palmdale to Los Angeles Section), resulting in decreases in level of service.

Summary of NEPA/CEQA Impacts

Cumulative construction impacts on the transportation network would be negligible under NEPA and not cumulatively considerable under CEQA because coordination and phasing with other projects would

minimize temporary effects to traffic. The cumulative operations impact of the project and other reasonably foreseeable projects on the transportation network would be beneficial because of the reduced congestion and delay, and improved mobility and access in the region.

Mitigation

Implement transportation mitigation measures provided in Section 3.2.7.

Air Quality and Global Climate Change

The study area for the cumulative analysis of air quality is the San Joaquin Valley Air Basin (SJVAB). The SJVAB is in an area federally designated as nonattainment for ozone and PM_{2.5}, federal maintenance for PM₁₀ and CO (urban portion of Fresno County only), and state nonattainment for ozone, PM₁₀, and PM_{2.5}. As a result, the area is subject to stringent emissions requirements for ozone precursors (VOC and NO_x) and particulate matter. Transportation projects included in the fiscally constrained regional transportation plans were modeled at the regional level and were shown to be consistent with transportation conformity requirements. Therefore, the regional impacts for the project presented in Section 3.3, Air Quality and Global Climate Change, are the same as those in the cumulative analysis. The local impacts for the project were also evaluated with the reasonably foreseeable projects within each county to determine if they would cause a significant cumulative impact.

Regulatory agencies continue to pass more stringent criteria pollutant and greenhouse gas emission standards with the goal of reducing the amount of pollutant emissions in the atmosphere. Many of these regulations are not yet implemented but would be prior to the project planning horizon of 2035. Overall air quality has improved and is anticipated to continue to improve because of these regulations. However, growth and proposed developments will result in thousands of new homes and millions of square feet of new retail uses. The associated increase in slow-moving traffic will continue to affect air quality to some incremental degree.

Construction

The San Joaquin Valley Air Pollution Control District (SJVAPCD) has adopted a cumulative threshold of significance of 10 pounds per day for ozone precursors (VOC and NO_x) and 15 tons per year for PM₁₀. Project construction emissions of ozone precursors would exceed the threshold, even after mitigation. Although construction emissions would be temporary, they would contribute to air quality degradation and impede the region's ability to attain air quality standards. This would result in cumulative construction air quality impacts that are substantial under NEPA and cumulatively considerable under CEQA.

What is a sensitive receptor?

A sensitive receptor for pollutant emissions includes schools, churches, residences, hospitals, and areas where the general public would congregate.

The proposed project construction includes enhanced dust control measures that would limit the exposure of fugitive dust to sensitive receptors; with mitigation, the project impact on air quality would still be significant for PM₁₀ and PM_{2.5} emissions. Because other foreseeable projects in the area determined to be significant for PM₁₀ and PM_{2.5} emissions would be constructed during the same timeframe as the proposed project, there would be a PM₁₀ and PM_{2.5} cumulative impact that is substantial under NEPA and cumulatively considerable under CEQA.

Short- and Long-Term Operations

The project would contribute to cumulative air emissions, with some effects caused by induced growth in the project vicinity. However, the project would provide an alternative mode of transportation that would reduce the amount of regional traffic relative to that generated under the future conditions in the project area.

A CO hot spots air dispersion modeling evaluation was performed and indicated that the project would cause a less-than-significant impact for CO emissions. The air dispersion modeling analysis uses

background ambient CO concentrations that account for nearby sources from past and present projects and actions, and the project analysis includes reasonably foreseeable projects that would contribute traffic to the intersections and road segments analyzed. Therefore, the CO hot spots results for the project would be the same as the cumulative CO impact and the project would not be cumulatively substantial or considerable for CO.

The long-term operation of the project would reduce ozone precursors more than would the No Project Alternative. Operation of the HST would help the region attain air quality standards and plans by reducing the amount of regional traffic and providing an alternative mode of transportation. Operation of the project would not exceed the SJVAPCD cumulative thresholds of significance for ozone precursors. There is a possibility that the power needed for the HST would result in an indirect greenhouse gas emissions effect from power generation facilities. However, the Authority would work with power suppliers to obtain sustainable renewable resources to minimize this significant effect.

Operations at the HMF would emit hazardous air pollutants (HAPs). The Castle Commerce Center HMF site is located within 1,000 feet of a sensitive receptor. An air dispersion analysis performed for the onsite sources at the HMF indicated that HAPs emitted would be less than significant for sources farther than 1,000 feet from the HMF. The operation of the remaining project components would not be a significant source of HAPs and would not contribute to a cumulative HAPs impact.

As described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008), the HST System as a whole would have less-than-significant impacts on air quality. The HST System would reduce vehicle miles traveled and result in systemwide air quality benefits. Temporary short-term emissions increases associated with construction activities and localized air pollution increases associated with traffic near proposed HST stations would be substantially reduced by mitigation strategies and design practices. The HST System would result in beneficial impacts related to GHGs and global climate change. Additional carbon entering the atmosphere, whether by emissions from the system itself or by removal of carbon sequestering plants (included agricultural crops), would be more than offset by the beneficial reduction of carbon resulting from the project due to a reduction in automobile vehicle miles traveled (mobile sources) and reduction in the number of airplane trips.

Summary of NEPA/CEQA Impacts

The cumulative construction impacts of the HST alternatives and other past, present, and reasonably foreseeable projects on air quality would be substantial under NEPA and cumulatively considerable under CEQA. Construction of the HST alternatives would increase regional pollutant emissions and exceed the SJVAPCD CEQA thresholds.

Cumulative operations impacts on air quality caused by the build-out of the projects envisioned by the general plans would be beneficial for ozone precursors and PM₁₀ emissions and negligible under NEPA and not cumulatively considerable under CEQA for CO. Specifically, operation of the HST alternatives would reduce regional VMT and consequently reduce ozone precursors and PM₁₀ emissions; the project would generate CO that would not exceed levels under the No Project Alternative and other reasonably foreseeable future projects.

Mitigation

With the implementation of mitigation measures for air quality and global climate change provided in Section 3.3.6, air quality impacts would remain substantial under NEPA and cumulatively considerable under CEQA during construction; during operations the impacts would be negligible under NEPA and not cumulatively considerable under CEQA.

Noise and Vibration

The No Project and HST alternative study area for the cumulative analysis of noise is within the screening distance (up to 1,300 feet), as discussed in Section 3.4, Noise and Vibration. There are several planned

and potential projects within the project corridor. The Castle Special Planning Zone project area would have potential cumulative noise and vibration impacts, and the Roeding Regional Park and Fresno Chaffee Zoo Facility Master Plans (City of Fresno 2011) would have potential cumulative noise impacts. All other projects are either located outside this area or do not have noise impacts.

Construction

Construction would result in noise and vibration effects that would be managed and limited in duration. There are a few areas where SR 99 and other roadway improvements may result in cumulative construction noise and vibration impacts. It is likely that multiple projects would be under construction at the same time in the cities of Merced and Fresno, but construction on these projects would typically occur during daytime hours or with the addition of noise control measures to stay within required noise limits, and would be temporary. Because construction would typically occur during daytime hours and remain within required noise limits, cumulative noise effects would be negligible under NEPA and not cumulatively considerable under CEQA.

Short- and Long-Term Operations

The HSTs would exceed the vibration thresholds at two locations in Le Grand during operation under the BNSF Alternative. No other projects are identified that would cause vibration impacts at these locations; therefore, no cumulative vibration impacts would occur.

The noise analysis compares conditions under an HST alternative with the existing condition, which is conservative, because noise is expected to be higher with population growth and expanded highways. The three HST alternatives are located in existing transportation corridors (UPRR, SR 99, and BNSF), which have high noise levels caused by traffic and freight train operations. In addition, the downtown areas of Fresno and Merced have high noise levels from multiple sources. Generally, noise levels would likely increase with the inclusion of the 2035 increases in population and accompanying development.

Several planned and potential transportation projects are within the project corridor along the proposed UPRR/SR 99 Alternative alignment. The primary projects involve the widening of SR 99 from four to six lanes north of Fresno and from six to eight lanes in Fresno. In addition, there are plans for intersection improvements along SR 99 throughout the project corridor, including interchanges at SR 140, SR 145, SR 152, SR 12, SR 17, the Grantland diagonal, and an overcrossing at Shields. There are also several minor road-widening projects within the City of Fresno for smaller arterial roadways. No projects near the BNSF Alternative alignment have been identified, and the number of foreseeable projects near the Hybrid Alternative is intermediate. The UPRR estimates that freight traffic may increase. However, these facilities (SR 99 and the railroads) would need to double their capacity to noticeably increase noise levels for the average person (i.e., an increase of 3 dBA).

The Castle Special Planning Zone environmental review analysis lists traffic noise impacts from roadway improvements and the potential for cumulative impacts from other projects. Because this project is located near the potential HMF site in Atwater and because of the spur between Merced and the HMF, there would be potential cumulative noise impacts (without mitigation). There are limited environmental analyses for the planned project roadway improvements.

The Roeding Regional Park and Fresno Chaffee Zoo Facility Master Plans (City of Fresno 2011) environmental review analysis lists the potential for significant cumulative noise impacts in conjunction with the HST alternative. Without mitigation, noise impacts resulting from the master plan in conjunction with the noise impacts resulting from the HST alternative in the vicinity of Roeding Park would be substantial under NEPA and cumulatively considerable under CEQA.

The HST System would operate more than 200 trains per day after full build-out of the HST System. In rural areas, where typical noise is approximately 60 dBA, passing trains would result in an average noise increase of 11 dBA. In urban areas, the increases would range from 0 to 7 dBA. Noise mitigation may be balanced with other objectives of more importance to the adjoining land uses, such as visual aesthetics and integration with the community context. Therefore, there is the possibility of residual severe noise

effects during HST operations along the alignment and at the HST stations, which could be cumulatively considerable with other foreseeable projects in the area. The effects would be less at the HMF sites, where HSTs would move slowly and create less noise.

Without mitigation, substantial and cumulatively considerable noise and vibration impacts would result from the project in conjunction with other planned projects, increased development associated with foreseeable projects, and the cumulative condition of the No Project Alternative.

The HST System as a whole could have a significant impact on noise and vibration. As described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008), the HST System would create construction-related short-term noise impacts. The HST System would also create long-term noise impacts from the introduction of a new transportation system, including potential vibration impacts. In the Merced to Fresno Section, building damage from construction vibration likely would be from impact pile driving conducted at close distances to buildings. Alternatively, the HST System would also result in benefits from long-term noise reduction due to the construction of separated grade crossings, such as the grade crossings proposed along the Caltrain corridor from San Francisco to San Jose. Mitigation measures would be expected to reduce impacts to a less-than-significant level.

Summary of NEPA/CEQA Impacts

The cumulative impact of the project and other reasonably foreseeable projects on noise during construction would be negligible under NEPA and not cumulatively considerable under CEQA because construction would typically occur during daytime hours and remain within required noise limit. Cumulative impacts during operations may have areas of substantial effects under NEPA and cumulatively considerable effects under CEQA without mitigation.

Mitigation

Mitigation measures for noise and vibration provided in Section 3.4.7 would be implemented.

To minimize the potential cumulative effects of overlapping construction activities within the same area, project activities would be coordinated with other, nearby projects under construction at the same time. This may reduce cumulative construction noise impacts.

The primary form of noise mitigation for transportation projects is noise barriers. The project and the reasonably foreseeable highway improvements would not benefit from shared noise barriers because of the differences in profile and project location. There would be potential shared benefits, such as the HST guideway shielding traffic noise in locations where the tracks are on a berm. However, even with mitigation measures in place for individual projects, areas of substantial and cumulatively considerable noise impacts are likely to remain.

Mitigation of land development projects associated with the No Project Alternative could be required. For example, if residential developments are built near transportation infrastructure, they would require shielding from noise sources.

Electromagnetic Fields and Electromagnetic Interference

There are no cumulative impacts related to EMF and EMI because none of the identified past, present, or reasonably foreseeable projects would have EMF impacts.

As described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008), the HST System as a whole could have significant direct and indirect EMF and EMI impacts. However, with mitigation, these impacts would be reduced to less-than-significant levels.

Public Utilities and Energy

The No Project and HST alternative study area for the cumulative analysis of public utilities and energy includes Merced, Madera, and Fresno counties. With the projected 2035 population and employment growth in the Central Valley, there would be an increased demand for utilities to support projected growth. Many of the planned and potential projects in the area reflect this increased growth, including numerous subdivisions and commercial developments.

Construction

Existing Utilities

Construction could require the temporary shutdown of utility lines, such as water, electricity, or gas, to safely move or extend these lines. Where necessary, project design and phasing of construction activities would minimize interruptions, including for upgrades of existing power lines to connect the HST system to existing PG&E substations. During construction, the potential for accidental disruption of utility systems including overhead utility lines (e.g., telephone and cable television) and buried utility lines (e.g., water, wastewater, and natural gas lines) is low due to the established practices of utility identification. Because of the short duration of the planned interruptions, construction activities would not contribute to a cumulative reduction in utility service; therefore, impacts would be negligible under NEPA and not cumulatively considerable under CEQA.

Water Infrastructure and Resources

Construction activities use water to prepare concrete, increase the water content of soil to optimize compaction, control dust, and re-seed disturbed areas. Construction of the HST alternative, in addition to other past, present, and reasonably foreseeable projects within the project area, would result in incremental temporary increases in demand for water. This increase in demand would not require construction or expansion of water treatment facilities, or new or expanded water entitlements. Because neither facility expansions nor new facilities are required, there is no cumulative impact under NEPA or CEQA.

Solid Waste/Recycling Facilities

Construction debris, such as concrete from demolished structures and asphalt from removed roadways, would result under the No Project Alternative and any of the three HST alternatives. Construction and demolition waste would be reused to the degree feasible. Other construction waste would be landfilled in a facility with sufficient permitted capacity to accommodate the project's solid waste disposal needs, causing a negligible and not cumulatively considerable incremental cumulative impact.

Short- and Long-Term Operations

Existing Utilities

In addition to the power requirements discussed below, the HST stations and HMF would require connections to local utility services including natural gas, petroleum, and telecommunications. Where necessary, the Authority will modify existing utilities to accommodate the project, including relocations and upgrades. The incremental draw on these services would be equivalent to similar commercial uses in the area and would be negligible. The HST alternative would not cumulatively contribute to overall demand for utility services (compared to the added demand created by 352,000 new households associated with the cumulative condition under the No Project Alternative); therefore, impacts on existing utilities would be negligible under NEPA and not cumulatively considerable under CEQA.

Water Infrastructure and Resources

The addition of 352,000 households under the cumulative condition of the No Project Alternative would require 4.48 billion gallons of potable water per year, assuming 127,400 gallons per household annually (American Water Works Association 2010). Commercial and industrial development would also generate increased water demand which would be projected by water providers and approved through a permitting process. Proportionate increases in wastewater treatment would also be required. As with

many communities throughout California, more conservation measures would be required to reduce water demand during multiple years of drought.

In comparison, operation of the HST alternative alignments would result in an annual water requirement of approximately 1.5% of existing water usage in the construction footprint, and demand for the station alternatives would be less than 0.01% of the total projected water demands of the municipalities that would serve the sites. There would be insignificant increases in the use of potable and nonpotable water or the generation of wastewater from the proposed HST stations and HMF. The additional demand because of the project in conjunction with the No Project Alternative and other reasonably foreseeable projects would not contribute to substantial or cumulatively considerable water resource impacts.

As described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008), the extension of facilities and provision of water and wastewater services for the entire HST System as a whole would have less-than-significant impacts and would not contribute to a substantial or cumulatively considerable impact from water demand, or a substantial or cumulatively considerable impact related to provision of water or wastewater infrastructure.

Solid Waste/Recycling Facilities

The project would generate solid waste during operation of the HST stations and HMF. The solid waste would be recycled to the extent that the waste management firms and utility districts implement recycling. With recycling, the effect of the project on solid waste facilities would be negligible. Existing solid waste facilities have permits to operate through the early 2030s and can serve the projected increase in population; therefore, the cumulative impacts on this resource are negligible under NEPA and not cumulatively considerable under CEQA.

For the HST System as a whole, the operation of the HMFs and stations would generate small volumes of solid waste and would not place a substantial demand on landfill capacity. For example, the waste generated in the San Francisco to San Jose Section would be landfilled in a facility with sufficient permitted capacity to accommodate the project's solid waste disposal needs, and the implementation of that HST section is not anticipated to result in cumulatively significant solid waste impacts. Because operation of the HST System would generate small volumes of waste and would not cause a substantial demand on landfill capacity, the HST System would not contribute to a substantial or cumulatively considerable impact on solid waste/recycling.

Energy

Under the cumulative condition associated with the No Project Alternative, there could be approximately 352,000 new households in the study area by 2035. Assuming 10,896 kWh per household (U.S. Energy Information Administration 2011), 3,835 MW of new power would be required in the study area. Residential development projects and associated commercial and industrial developments are required to apply for permits and undergo environmental review so that the electricity demands of the project can be met. In addition, electricity providers perform regular demand projections that include the demand created by planned development. New transmission and distribution lines would need to be built, or existing facilities would need to be upgraded to serve the increased demand. There are no major electrical infrastructure projects identified on the list of reasonably foreseeable projects.

The project engineers have conservatively estimated that the electrical demand for the propulsion of the HSTs and operation of the HSTs at terminal stations, storage depots, and maintenance facilities would be 8 GWh per day. This is an increment of additional electrical load on the electric power system. However, HSTs use less absolute energy than an airplane service that provides only 25% of the passenger carrying capacity. Cumulatively, the HST alternatives are beneficial from an energy conservation perspective. Upgrades to existing transmission lines for the HST alternatives would result in negligible under NEPA and no cumulatively considerable impacts under CEQA.

As described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008), the HST System would have a significant

impact on statewide electricity demand. However, because the HST System is a more energy-efficient mode of transportation than travel by aircraft or car, the system would result in an overall reduction in total energy consumption (combined electric power demand and oil consumption).

Summary of NEPA/CEQA Impacts

Construction activities would not contribute to a cumulative reduction in utility service because of the short duration of any planned interruptions, and impacts would be negligible under NEPA and not cumulatively considerable under CEQA. This increase in demand would not be anticipated to require construction or expansion of water treatment facilities and not require new or expanded water entitlements, resulting in negligible impacts under NEPA and not cumulatively considerable impacts under CEQA. Other construction waste would be landfilled in a facility with sufficient permitted capacity to accommodate the project's solid waste disposal needs, therefore causing a negligible and not cumulatively considerable incremental cumulative impact.

During operations, the HST would not cumulatively contribute to overall demand for utility services (when compared to the added demand created by 352,000 new households associated with the No Project Alternative); therefore operations impacts on existing utilities would be negligible under NEPA and not cumulatively considerable under CEQA. The additional demand because of project operations in conjunction with the No Project Alternative and other reasonably foreseeable projects would not contribute to substantial or cumulatively considerable water resource impacts. Existing solid waste facilities have permits to operate through the early 2030s and can serve the projected increase in population and operations requirements of the HST system; therefore, the cumulative impacts on this resource are negligible under NEPA and not cumulatively considerable under CEQA.

Upgrades to existing transmission lines for the HST alternatives would result in negligible and not cumulatively considerable impacts when compared to the No Project Alternative.

Mitigation

Although cumulative impacts would be negligible under NEPA and not cumulatively considerable under CEQA, the HST project would implement the measures provided in Section 3.6.7 to reduce project effects on public utilities and energy.

Biological Resources and Wetlands

The No Project and HST alternative study area for the cumulative analysis of biological resources and wetlands considers the distribution of their habitat in the San Joaquin Valley. For wetlands, the study area includes the Middle San Joaquin-Lower Chowchilla Watershed (HUC 18040001) and the Tulare-Buena Vista Lakes Watershed (HUC 18030012) (CDFG 2009). The Middle San Joaquin-Lower Chowchilla Watershed includes Fresno, Madera, Mariposa, Merced, San Benito, and Stanislaus counties (EPA 2010a). The Tulare-Buena Vista Lakes Watershed includes Fresno, Kern, Kings, Madera, San Luis Obispo, and Tulare counties (EPA 2010b). Because of the length of the Merced to Fresno Section, the study area for San Joaquin kit fox is its range in the Central Valley, from southern Kern County to eastern Alameda County and eastern Stanislaus County. This area includes Alameda, Merced, Madera, Fresno, Kings, Tulare, San Joaquin, Contra Costa, Kern, and San Benito counties (California State University at Stanislaus 2006).

Construction and Short- and Long-Term Operations

Historical development patterns show that the Central Valley has lost 99% of its native grasslands and valley oak savanna, 95% of its wetlands, 66% of the vernal pools, and 89% of its riparian woodlands (CDFG 2007). The natural landscape has been converted into agricultural land, rural residential areas, and urban areas, which has reduced and fragmented the available wildlife habitat and limited the movement of wildlife between remaining habitat areas. Even under existing regulations that protect resources and mitigate potential impacts, these trends could persist under the No Project Alternative given the projected 68% increase in population by the year 2035 that could result in the conversion of

93,000 acres of vacant land to urban uses. Given the currently available information, the extent of impact is unknown; however, land use planning controls are anticipated to protect the most valuable habitats.

The HST alternatives combined with foreseeable projects are anticipated to affect the following biological resources:

- Special-status species in northern claypan vernal pools, such as Conservancy fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, succulent owl's-clover, Boggs Lake hedge-hyssop, Colusa grass, San Joaquin Valley Orcutt grass, hairy Orcutt grass, vernal pool smallscale, and Wright's trichocoronis. Effects on northern claypan vernal pools may result in take of individual plants and animals associated with this habitat type. With the implementation of avoidance, minimization, and mitigation measures, the project and other foreseeable projects would affect a small proportion of suitable habitat within the reported range of these species. The loss of habitat is not anticipated to result in the loss of any sustainable populations associated with this habitat type. Therefore, cumulative impacts would be moderate under NEPA and not cumulatively considerable under CEQA.
- Special-status species in vernal pools and adjacent California annual grasslands, such as California tiger salamander, western spadefoot toad, Hoover's spurge, palmate-bracted bird's beak, Henderson's bent grass, brittlescale, San Joaquin spearscale, lesser saltscale, subtle orache, Lost Hills crownscale, dwarf downingia, spiny-sepaled button-celery, Coulter's goldfields, little mouse tail, pincushion navarretia, shining navarretia, Heckard's pepper-grass and prostrate vernal pool navarretia. Vernal pool and adjacent California annual grassland habitat within the known range of these special-status species would be affected by the project and other foreseeable projects. However, the loss of habitat is not anticipated to result in the loss of sustainable populations associated with this habitat type if avoidance, minimization, and mitigation measures are implemented. Therefore, cumulative impacts would be moderate under NEPA and not cumulatively considerable under CEQA.
- Special-status species in California annual grasslands, such as San Joaquin kit fox, American badger, Hartweg's golden sunburst, Keck's checkerbloom, heartscale, Hoover's calycadina, beaked clarkia, Hoover's cryptantha, recurved larkspur, and caper-fruited tropidocarpum. The loss of California annual grassland habitat and take of associated individual special-status plants and animals could occur. The project and other foreseeable projects are not expected to result in the loss of a substantial proportion of California annual grasslands and would not result in the loss of populations that are dependent on California annual grassland habitat. Therefore, cumulative impacts would be moderate under NEPA and not cumulatively considerable under CEQA.
- Sanford's arrowhead, San Joaquin roach, Kern brook lamprey, and western pond turtle habitat in all watercourses within the study area. Hardhead occur in Bear Creek; Central Valley steelhead occur in Cottonwood Creek and the San Joaquin River; and spring-run Chinook salmon and Central Valley fall/late fall-run Chinook salmon occur in the San Joaquin River. A coordination meeting with the California Department of Water Resources and the Bureau of Reclamation on June 6, 2011, regarding the potential effects on the proposed San Joaquin River Restoration program concluded that the Merced to Fresno Section is unlikely to result in effects on the restoration program. The project and other foreseeable projects may affect watercourses that provide potentially suitable habitat for these special-status species and may result in individual take; however, these projects would not result in the loss of any populations. Therefore, cumulative impacts would be moderate under NEPA and not cumulatively considerable under CEQA.
- Golden eagle, Swainson's hawk, western snowy plover, white-tailed kite, American peregrine falcon, greater sandhill crane, bald eagle, Belding's savannah sparrow, western burrowing owl, and other migratory bird and raptor foraging and nesting habitat. The project and other foreseeable projects may affect nesting and foraging habitat associated with individual special-status birds. Nesting and foraging habitat for these species is variable; however, the projects are not expected to result in the loss of sustainable populations of sensitive bird species. Therefore, cumulative impacts would be moderate under NEPA and not cumulatively considerable under CEQA.

- Western red bat, western mastiff bat, and pallid bat foraging and roosting habitat. The loss of potential roosting and foraging habitat for these species is expected. Roosting and foraging habitat for these species is variable, and these species have large ranges that extend throughout California. The projects may result in individual take but would not result in the loss of local populations of these species. Therefore, cumulative impacts would be moderate under NEPA and not cumulatively considerable under CEQA.
- San Joaquin kit fox dispersal habitat. Dispersal habitat for San Joaquin kit fox may be affected by the project and other foreseeable projects within the study area. Disruption to linkages and movement corridors may result in isolated populations that are at greater risk of extirpation. Therefore, cumulative impacts would be moderate under NEPA and cumulatively considerable under CEQA.
- Valley elderberry longhorn beetle host plant habitat. The project and other foreseeable projects within the range of this species may result in the loss of elderberry shrubs that provide suitable valley elderberry longhorn beetle habitat. Suitable habitat and reported occurrences of valley elderberry longhorn beetle are located throughout the study area. These projects would not result in the loss of local populations of this species. Therefore, cumulative impacts would be moderate under NEPA and not cumulatively considerable under CEQA.
- Delta button-celery riparian scrub habitat. Riparian scrub habitat within the range of delta button-celery may be affected by the project and other foreseeable projects. This species is listed as a seriously endangered California endemic with a relatively limited range. The loss of suitable riparian scrub habitat may result in the loss of populations of this species; however, avoidance, minimization, and mitigation measures would minimize the effects on this species. Therefore, cumulative impacts would be moderate under NEPA and not cumulatively considerable under CEQA.
- California satintail mesic habitat. The project and other foreseeable projects may result in the loss of potentially suitable mesic habitat. This species is seriously endangered in California but is more common elsewhere. The loss of suitable mesic habitat in the study area could result in individual take, but is not likely to result in the loss of local populations of this species. Therefore, cumulative impacts would be moderate under NEPA and not cumulatively considerable under CEQA.
- Wetlands. Wetlands may be affected by the project and other foreseeable projects. Potential wetland losses would be small relative to the quantity of existing wetland habitat in the study area but would contribute to the net loss of wetland habitat within the California Central Valley. Avoidance, minimization, and mitigation measures would minimize impacts on wetlands. Therefore, cumulative impacts would likely be substantial under NEPA and cumulatively considerable under CEQA.

The proposed project, in conjunction with reasonably foreseeable projects, would increase the extent and concentration of invasive plant species. Without weed control measures, potential impacts resulting from the spread of these species could be substantial under NEPA and cumulatively considerable under CEQA.

The proposed project, in conjunction with reasonably foreseeable projects, could contribute to potential cumulative impacts on wetlands and other Waters of the United States and state (e.g., vernal pools and creeks with a riparian corridor) and special status species (e.g., San Joaquin kit fox, western spadefoot, California tiger salamander, migratory nesting birds, valley elderberry longhorn beetle, and western burrowing owl). In addition, the project may contribute to cumulative impacts on the San Joaquin kit fox given its range and the 68% growth rate expected for the area by 2035. Most impacts would be moderate under NEPA and not cumulatively considerable under CEQA. However, cumulative impacts on the San Joaquin kit fox would likely be moderate under NEPA and cumulatively considerable under CEQA, and cumulative impacts on wetlands would be substantial under NEPA and cumulatively considerable under CEQA.

The HST System as a whole would have significant impacts on sensitive biological resources and wetlands. Segments of the HST System located in new corridors could result in disturbance of sensitive habitats, as described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the 2008

Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008). The HST System could also pose a significant barrier to the movement of wildlife in areas where it severs wildlife movement corridors, such as those in the East Bay to Central Valley and the San Jose to Central Valley corridors.

Summary of NEPA/CEQA Impacts

Construction and operations cumulative impacts on most biological resources would be moderate under NEPA and not cumulatively considerable under CEQA because most impacts would not result in the loss of species populations. Impacts on the San Joaquin kit fox would be moderate under NEPA and cumulatively considerable under CEQA because disruption to linkages and movement corridors may result in isolated populations that are at greater risk of extirpation. Impacts on wetlands would be substantial under NEPA and cumulatively considerable under CEQA because of the overall amount of land that would be converted to urban and transportation uses under the cumulative condition and the HST alternatives.

Mitigation

After implementing avoidance and minimization measures, and mitigation measures for unavoidable impacts provided in Section 3.7.6, the cumulative construction and operational impacts on biological resources would remain moderate under NEPA and cumulatively considerable under CEQA.

Hydrology and Water Resources

The No Project and HST alternative study area for the cumulative analysis of hydrology and water resources is approximately defined by the City of Merced to the north, the City of Fresno to the south, the lower San Joaquin River to the west, and the Sierra Nevada Mountain foothills and reservoirs to the east. The cumulative impact study area includes the project impact study area and upstream and downstream reaches of streams and rivers that cross through the study area. Potential impacts on hydrology and water resources could, in some cases, extend several thousand feet upstream and downstream from the project.

Construction

Construction of the HST alternatives, in conjunction with construction activities associated with other past, present, and reasonably foreseeable projects, could alter existing drainage patterns and redirect stormwater runoff. The HST alternatives and other future projects would be subject to regulations and permits required by the Central Valley Regional Water Quality Control Board to mitigate construction impacts on water quality. Therefore, potential cumulative construction impacts would be reduced, and cumulative construction impacts on water quality and water resources would be negligible under NEPA and not cumulatively considerable under CEQA.

Short- and Long-Term Operations

The new urbanization that would accommodate the population increase by 2035 would result in an estimated 93,000 acres of additional development and land use changes to accommodate housing, commercial, office, transportation, parks, and schools (see Chapter 2, Alternatives). These changes would affect surface water and groundwater hydrology. The increased area of impervious surfaces would cause changes in runoff patterns, surface water, and groundwater.

The project would result in changes to hydrology and connectivity of natural watercourses, including floodways, where the project crosses these watercourses. Similar impacts would occur where other projects cross or otherwise alter the hydrology of a natural watercourse. However, potential cumulative impacts would be reduced because all projects are subject to project-level environmental analysis and permits, such as compliance with the State Water Resources Control Board Construction General Permit (2009-0009 DWQ) and Title 23 of the California Code of Regulations. Project-level analysis would identify and analyze, and avoid, minimize, or mitigate potential impacts on hydrology and connectivity of natural watercourses, to the extent feasible.

Reasonably foreseeable projects would result in impacts on flooding if the projects are within a Special Flood Hazard Area (SFHA), such as the Buena Vista Project. Similar impacts would result from operation of the project where the alignment would cross SFHAs. However, potential cumulative impacts would be reduced because all projects in SFHAs are subject to project-level environmental analysis, standards, and permits (prepared by project proponents). Project-level analyses would identify and analyze, and avoid, minimize, or mitigate potential impacts on floodplains, to the extent feasible; therefore, impacts on floodplains would be negligible under NEPA and not cumulatively considerable under CEQA.

The reasonably foreseeable projects would result in changes to existing onsite drainage patterns and could result in increased stormwater runoff from an increase in impervious surface area. Conversion of vacant undeveloped land to accommodate the population by 2035 is estimated at 93,000 acres, which would result in up to 33,000 acres of new impervious surface (assuming an average of 35% of new development is impervious). However, new developments would comply with stormwater control ordinances, thus mitigating the impact of the runoff. On a much smaller scale, similar impacts would result from operation of the project because of the increase in impervious surface area caused by structures and parking facilities at the HST stations and HMF. Guideway construction materials and soil compaction below the guideway would also inhibit infiltration.

The project would negligibly reduce the amount of groundwater available for use in the study area because of an increase in impervious surface area and reductions in infiltration. Therefore, the project would minimally contribute to a cumulative impact on groundwater quantity when considered in combination with other past, present, and future projects and would result in impacts that are negligible under NEPA and not cumulatively considerable under CEQA.

Irrigation Distribution System

Under the No Project Alternative, an estimated 23,200 acres of farmland would be converted to urban uses. This would reduce the water demand in those urbanized areas because agricultural uses require more water than does domestic consumption. Depending on the HST alternative selected, the project would affect up to approximately 1,361 additional acres of farmland, which would contribute to the cumulative condition. As a result, the HST alternatives would potentially reduce the amount of irrigation water needed when compared to the No Project Alternative cumulative condition.

Water Quality

Some of the foreseeable projects identified for the study area (e.g., dairy expansion, new urban development, and mining operations) would potentially create new sources of runoff pollution that would contribute to the cumulative condition with any of the HST alternatives. Preservation of water quality is anticipated to be a greater challenge by 2035 under the cumulative condition of the No Project Alternative.

Similar to the proposed project, other projects would be subject to regulations and permits required by the Central Valley Regional Water Quality Control Board to mitigate impacts on water quality. Therefore, potential cumulative impacts would be reduced. These regulations are in place to make sure that new developments and infrastructure projects do not result in water quality standard violations.

The HST System as a whole would have cumulative hydrology and water quality impacts that are moderate under NEPA and not cumulatively considerable under CEQA, with implementation of mitigation measures. The construction of the HST System predominantly in existing transportation corridors would reduce the potential for cumulatively adverse effects to water resources, and engineering and design practices would further reduce potential adverse impacts.

Summary of NEPA/CEQA Impacts

Because the HST alternative and other future projects would be subject to regulations and permits required by the Central Valley Regional Water Quality Control Board to mitigate construction impacts on water quality, construction impacts would be negligible under NEPA and not cumulatively considerable under CEQA.

During operations, impacts on floodplains and groundwater would be negligible under NEPA and not cumulatively considerable under CEQA: project-level analyses would avoid, minimize, or mitigate potential impacts on floodplains, to the extent feasible; and the HST alternatives would contribute only negligible reductions in the amount of groundwater available. Cumulative operations impacts on hydrology and water quality would be moderate under NEPA and not cumulatively considerable under CEQA because all projects would be subject to regulations and permits required by the Central Valley Regional Water Quality Control Board to mitigate impacts on water quality.

Mitigation

Although cumulative hydrology and water resources impacts would be negligible in most cases under NEPA and not cumulatively considerable under CEQA, the HST project would implement the measures for hydrology and water resources provided in Section 3.8.6 to minimize impacts. These measures would contribute to keeping water quality cumulative impacts moderate under NEPA and not cumulatively considerable under CEQA.

Geology, Soils, and Seismicity

The No Project and HST alternative study area for the cumulative analysis of geology, soils, and seismicity is the San Joaquin Valley region, because impacts (e.g., erosion and sedimentation) would affect areas around the region, and some seismic impacts (e.g., a large earthquake) while originating in other areas, could affect the project footprint.

Construction

Construction of facilities and infrastructure under the No Project Alternative and for any of the HST alternatives would require aggregate, concrete, and steel reinforcement. When considered in total, there would be a large demand for these and other construction materials. However, it is anticipated that sufficient materials are available to meet this demand. Under the No Project Alternative and for any of the HST alternatives, standard engineering design measures and BMPs during construction would moderate construction impacts on geology, soils, and seismicity. Construction impacts would be localized, and cumulative effects would be negligible under NEPA and not cumulatively considerable under CEQA.

Short- and Long-Term Operations

Historically, existing agricultural and urban development has substantially altered geology and soil conditions throughout the study area. Projects during the nineteenth century and early twentieth century produced cumulative impacts related to geology and soils that were largely negative because of substandard construction and land use practices. The cumulative impacts of past design, construction, and land use practices caused secondary effects, such as deteriorating water and habitat quality of streams and rivers.

Under the No Project Alternative or any of the HST alternatives, the direct and indirect impacts on geology, soils, and seismicity would be largely controllable with appropriate designs and implementation of BMPs and mitigation measures during design, construction, and operation. Some direct and indirect impacts would be unavoidable, such as the incremental reduction in aggregate supply and continued use of aging infrastructure that could be more susceptible to geologic risks. The development that would be required to accommodate the population growth by 2035 (e.g., housing developments, infrastructure, and roadway and highway projects), would have a greater impact. Cumulative impacts would be slightly greater under an HST alternative but would still be considered negligible under NEPA and not cumulatively considerable under CEQA.

Impacts from seismic hazards for multiple structures have been identified as a cumulative impact. In addition, soil settlement and slope failures could occur in areas with shallow groundwater, near streams, and in areas with certain types of soil (e.g., shrink-swell soils could affect the structural integrity of infrastructure facilities and buildings.) All structural components of the HST alternatives and the reasonably foreseeable projects under the No Project Alternative would be designed to meet or exceed

engineering design requirements for railways, highways, and buildings. These new structures would be able to withstand ground motions that have a low probability of being exceeded. Construction methods and designs would reduce the potential effects on structures caused by soil conditions. This would result in improved public safety. It is also possible that some liquefaction-related hazards, such as lateral spreading, might be reduced if projects adjacent to the HST alternative or HMF (e.g., the SR 99 Avenue 7 to Avenue 12 widening) include ground improvements. Cumulative impacts resulting from seismic hazards would be negligible under NEPA and not cumulatively considerable under CEQA.

As described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008), the HST System as a whole could have significant impacts on geology and soils, which could be reduced to less than cumulatively significant with implementation of mitigation. Significant impacts related to slope stability (in areas susceptible to slope failure) as well as impacts related to subsidence (if other concurrent construction projects in the area dewater from the same drainage basin) could cause cumulatively considerable impacts to occur. These impacts could be reduced to less than cumulatively significant with implementation of project-specific measures to reduce impacts.

Summary of NEPA/CEQA Impacts

The cumulative construction and operations impacts of the project and other reasonably foreseeable projects on the geologic, soil, and seismic conditions during construction and operation would be negligible under NEPA and not cumulatively considerable under CEQA because standard engineering design measures and BMPs would moderate impacts on geology, soils, and seismicity.

Mitigation

Although cumulative impacts would be negligible under NEPA and not cumulatively considerable under CEQA, the HST project would follow the measures for geology, soils, and seismicity listed in Section 3.9.6 during construction and operation of the project to reduce project impacts.

To further minimize cumulative impacts related to the depletion of aggregate supplies and building materials, coordinate with other projects that are under construction at the same time to create opportunities to reuse excavated soil and demolition debris among the projects.

Hazardous Materials and Wastes

The No Project and HST alternative study area for the cumulative analysis of hazardous materials and wastes is the same as the study area used in the assessment of the proposed HST alternatives in Section 3.10, Hazardous Materials and Wastes.

Historically, the Merced to Fresno corridor has had numerous industrial and agricultural zones, large industrial and agricultural facilities, major transportation routes, and distribution systems including petroleum pipelines. The transportation routes pipelines are used to transport large quantities of hazardous materials and petroleum products. The lack of hazardous material regulations before RCRA was enacted resulted in areas of environmental contamination. Documentation of these hazardous waste sites, regulatory oversight, and clean-up efforts began in the early 1980s under CERCLA. Enterprises that use, store, transport, or dispose of reportable quantities of hazardous materials or petroleum products are now required to comply with federal, state, and local regulations designed to minimize the risk of exposure or release of hazardous materials.

Construction

Construction of the HST alternatives and past, present, and reasonably foreseeable projects would temporarily increase, and, therefore, contribute incrementally to the regional transportation, use, storage, and disposal of hazardous materials and petroleum products (such as diesel fuel, lubricants, paints, solvents, and cement products containing strong basic or acidic chemicals). While hazardous materials

handling may increase during construction, compliance with regulations would reduce potential cumulative impacts to negligible under NEPA and less than significant under CEQA.

Short- and Long-Term Operations

The 68% increase in population by the year 2035 is anticipated to contribute incrementally to historical increases in the transport, storage, use, and disposal of hazardous substances within the Merced to Fresno corridor. Households, industrial sites, and agricultural operations use hazardous materials and generate hazardous waste. HMF operations would incrementally cause a negligible increase in these activities, because the facility would use, store, and dispose of hazardous materials and petroleum products on a regular basis. HMF operations would comply with regulatory requirements to minimize the risk of exposure to or release of hazardous materials. Conversely, development of foreseeable future projects and an HST alternative would potentially result in incidental improved environmental quality because of the discovery and required remediation of existing soil and water contamination. For this reason, it is possible that there would be fewer contaminated sites under the cumulative condition in 2035. The cumulative condition would reduce traffic congestion and would improve mobility and access on the regional transportation network, resulting in negligible changes to the risk of accidental spills or releases of hazardous materials. Overall cumulative impacts on the transportation, use, storage, and disposal of hazardous materials would be negligible under NEPA and not cumulatively considerable under CEQA.

As described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008), the HST System as a whole would have less-than-significant impacts on hazardous materials and waste, with implementation of mitigation measures, which would be less than cumulatively considerable. While hazardous materials may be unearthed during project construction, such as at the Diridon Station (San Francisco to San Jose Section), hazardous wastes encountered through ground-disturbing activities during construction would be handled and disposed of in accordance with regulatory requirements.

Summary of NEPA/CEQA Impacts

Construction and operations impacts on the transportation, use, storage, and disposal of hazardous materials would be negligible under NEPA and not cumulatively considerable under CEQA because the HST alternatives and other future projects would comply with regulatory requirements that minimize the risk of exposure to or release of hazardous materials.

Mitigation

Although cumulative impacts would be negligible under NEPA and not cumulatively considerable under CEQA, the HST project would implement mitigation measures for hazardous materials and wastes provided in Section 3.10.7 to minimize impacts, thereby reducing cumulative impacts.

Safety and Security

The No Project and HST alternative study area for the cumulative analysis of safety and security includes the transportation system and fire protection, law enforcement, and other emergency response service areas in the southern half of Merced County, Madera County, and the City of Fresno. This study area allows a review of other projects under the No Project Alternative that would affect emergency response and evacuation routes because of impacts on roadway connectivity and emergency service providers.

The project would be located in mostly rural areas. Small- to medium-size populations would be concentrated in urban areas. In rural areas, low-density road networks; barriers formed by the UPRR, SR 99, and BNSF rights-of-way; and fewer fire stations, with low staffing levels, would result in longer emergency response times. Cumulative impacts are anticipated during construction and operation of the project.

Construction

Under the No Project Alternative, the number of construction workers required to meet the needs of the growing population in 2035 will result in an increased demand for emergency response services. However, most of this development would occur over time, thus allowing local agencies to plan for the increased demand and reduce the impact. Combining the highway projects under the No Project Alternative with the construction of any of the HST alternatives would require several thousand construction workers per year from the surrounding communities during the HST construction period. The increase in construction population would temporarily increase the need for fire protection, law enforcement, and other emergency response services. If all planned transportation projects are built simultaneously, Madera County emergency services may be overburdened, especially if current budget challenges persist. However, many of the other planned projects associated with the No Project Alternative are currently on hold because of the economy, which postpones the need for some of the construction workers. Construction of the project may occur prior to construction of many of the other projects, effectively mitigating the cumulative impact on emergency services. Construction workers must follow strict OSHA and safety practices, thus reducing the demand on emergency services.

With or without the proposed project, budget cuts would continue to reduce staff and close fire stations in some areas of the corridor. The population is growing in the corridor, but crime rates have been decreasing in nearly every city in the corridor. The violent and property crime rates in Merced are lower than the state average (Federal Bureau of Investigation 2008), and the City of Fresno finished 2009 with its lowest crime rate since the 1970s (City of Fresno Police Department 2011). Accommodating the population growth expected by 2035 would result in a cumulative increase in demand for fire protection, law enforcement, and other emergency response services. A large number of residential projects, many of which include commercial components, would substantially increase the population in Madera County, and to a lesser extent, the populations of Merced and Fresno counties. The additional long-term demand would be particularly difficult to accommodate in Madera County without additional funding for fire protection and law enforcement agencies. Cumulative construction impacts on emergency service demands in Madera County could be moderate under NEPA and cumulatively considerable under CEQA.

During construction, the project would negligibly contribute to increased response times by emergency services, because of roadway improvements that include overpasses and crossings approximately every 2 miles, at minimum; resulting construction impacts on emergency response times would be negligible under NEPA and not cumulatively considerable under CEQA.

Short- and Long-Term Operations

The cumulative effect of future projects and HST alternatives is anticipated to provide beneficial effects for the emergency response capability within the study area during project operations. Planned transportation projects in the study area would widen existing roadways (including SR 99), create new grade-separated crossings for the UPRR or BNSF tracks, and construct new interchanges along SR 99. Without an HST alternative, the planned highway projects that would occur under the No Project Alternative would improve the roadway network connectivity, reduce congestion, and cumulatively benefit fire protection, law enforcement, and other emergency services through better response times and access. However, with the transportation improvements planned for SR 99 and the urban areas along SR 99, Caltrans operating standards would not be met in some urban areas in 2035. Non-urban areas would operate at a level of service of D or better (Caltrans 2009).

Travel safety would be a cumulative benefit with the project and SR 99 safety improvement projects. Both would improve overall safety in regional travel. SR 99 would remove at-grade intersections and substandard designs. The HSTs would provide a transportation option that is safe during inclement weather. In addition, the project would help improve other transportation projects and reduce emergency response times by constructing new grade separations for the BNSF tracks and SR 99 and by reducing the volume of traffic on SR 99 (some long-distance travelers would use the HST System instead of driving).

Some project alternatives could affect a private airstrip. Similarly, planned future projects could encroach on airports and private airstrips. It is unlikely that future development projects would affect municipal airports because land management plans limit development near those airports.

The HST System as a whole would result in less-than-significant impacts on safety and security, with implementation of mitigation measures, and would not be cumulatively considerable. Overall, the system could result in greater safety and security with installation of grade separations at roadway crossings. For example, roadway separations along the Caltrain corridor (San Francisco to San Jose Section) would improve safety in the study area. In other sections of the HST System, construction could result in traffic detours and longer emergency response times (for example at locations along the Merced to Fresno Section), and peak short-term demand for emergency services would increase during construction (Fresno to Bakersfield Section); such impacts could be mitigated to less than cumulatively significant.

Summary of NEPA/CEQA Impacts

Cumulative construction impacts on emergency service demands could be moderate under NEPA and cumulatively considerable under CEQA because of the projected population increases and the influx of construction activities. Construction impacts on emergency response times would be negligible under NEPA and not cumulatively considerable under CEQA because the HST alternatives would provide roadway overpasses and crossings approximately every two miles. Cumulative impacts on safety and security during operation would be beneficial because of improvements to travel safety and emergency response accessibility.

Mitigation

The Authority would coordinate with city and county law enforcement agencies and fire departments through the Fire and Life Safety Program regarding the adequacy of services for planned growth in the cities and counties and the anticipated temporary increase in the number of construction workers. The Fire and Life Safety Committee, which would comprise members of the Authority and local law enforcement agencies and fire departments, could consider strategies, such as concentrating housing for construction workers in other areas of the corridor, to reduce the impact on Madera County emergency services. With these mitigation measures, as presented in Section 3.11.7, cumulative construction impacts on emergency service demand in Madera County could be reduced to negligible under NEPA and not cumulatively considerable under CEQA.

Socioeconomics, Communities, and Environmental Justice

The No Project and HST alternative study area for the socioeconomics, communities, and environmental justice cumulative impacts analysis includes the cities of Atwater, Merced, Chowchilla, Madera, and Fresno and the unincorporated areas of Merced, Madera, and Fresno, counties.

Construction

Community Cohesion, Neighborhoods, and Community Facilities

Construction of the proposed project and other planned projects is not anticipated to result in adverse cumulative impacts on neighborhoods and community facilities except in the downtown areas of Merced and Fresno where the HST stations would be constructed. Cumulative impacts would include temporary increases in traffic, changes in traffic patterns, changes in access to community facilities, and construction noise and dust. Construction activities can hinder access and interaction among neighborhoods because of increased congestion, detours, and lane or road closures. These impacts would be greatest if several of the other foreseeable projects are constructed at the same time, and would likely be substantial under NEPA and cumulatively considerable under CEQA.

Economics

The study area is within the California Central Valley, which is known for its agricultural production. Although the agricultural sector is not the largest employer, it accounts for one in six jobs. The largest

employers are the service and government sectors, which together account for 50% of all industry jobs in the study area. Unemployment rates in the study area are typically higher than those for the state, and they are among the highest in the state. Unemployment rates for 2010 were 18.9%, 15.6%, and 16.8%, respectively, for Merced, Madera, and Fresno counties (CEDD 2011).

Under the No Project Alternative, numerous planned and potential projects would be necessary to accommodate the population growth by 2035. The growth would result in a cumulative economic impact, especially with respect to employment and unemployment rates. Because the construction schedule and the workforce required during construction and operation of the project has not been fully developed, cumulative economic impacts cannot be identified or quantified at this time. The addition of a large construction project, such as the proposed project, would cumulatively stimulate local economies. The conversion of agricultural land to nonagricultural uses may result in increased unemployment rates for agricultural workers if they are unable to find work on another farm in the region.

Construction of an HST alternative and other planned projects would cause large increases in the number of jobs and spending within the Merced to Fresno Section. Depending on the HST alternative selected, construction of the HST is anticipated to create between 8,000 and 15,000 jobs (including both direct and indirect jobs) over the 5-year construction period, and that number could increase by 2,300 to 4,000 jobs if an HMF is constructed in the Merced to Fresno Section. Combined with the anticipated new homes, roads, and infrastructure, the economic benefits would be cumulatively substantial. Construction would require the relocation of businesses; however, most businesses that would relocate under any of the HST alternatives would continue to benefit from the improved economy. The cumulative construction effects of the HST system and reasonably foreseeable future projects in conjunction with projected population and employment growth would be beneficial to the local and regional economy.

Environmental Justice

Populations within the study area are ethnically diverse and low-income. All but three of the census block groups within the study area have communities of concern, based on the high concentration of minority or low-income populations. Cumulative impacts of construction would not be appreciably more severe or greater in magnitude than effects on non-communities of concern populations; however, even though low-income residents in the affected neighborhoods would be exposed to the same impacts as other residents, the cumulative impact on low-income residents could be disproportionately high and adverse and could be a greater hardship for them.

Near- and Long-Term Operations

Community Cohesion, Neighborhoods, and Community Facilities

Transportation projects can bisect neighborhoods and reduce community cohesion. Railways may be perceived as a barrier in current development. However, in the study area, communities developed around the railways; the railways did not originally bisect the communities.

The HST alternatives are located in both unincorporated and incorporated areas of Merced, Madera, and Fresno counties. All of the three HST alternatives are primarily located adjacent to an existing transportation corridor, which can be perceived as an existing barrier, and therefore would not result in any considerable changes to the perception of a barrier within communities. The potential barrier would not be a physical barrier because in these communities all alternatives are designed to minimize any effect on circulation. Therefore, they would not further disrupt community cohesion over the existing condition. After mitigation, the project may help minimize these barriers by potentially adding amenities below elevated HST guideways and implementing other measures to minimize the visual and noise impacts.

The guideway to the Castle Commerce Center HMF site is an exception, because the guideway would create a new transportation corridor between SR 99 and Santa Fe Avenue through the unincorporated Community of Franklin-Beachwood. In combination with the Atwater-Merced Expressway, which traverses in a nearly perpendicular direction, cumulative impacts on the community may be substantial under NEPA and cumulatively considerable under CEQA.

In general, HST operations would benefit neighborhoods and communities by increased access and the potential for redevelopment within HST station areas. The proposed project, in conjunction with other projects, would result in primarily beneficial cumulative impacts on neighborhoods and community cohesion. In many neighborhoods, other transportation improvements and economic development projects would collectively enhance access options and reduce travel time to regional destinations.

The HST System as a whole could result in significant impacts associated with community and neighborhood cohesion and property loss, which would be cumulatively considerable along with other foreseeable projects. Impacts could occur in areas of the HST System that are not within existing railroad rights-of-way, due to the creation of new transportation corridors, as described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008). For example, during construction, the HST System could result in impacts on community cohesion in the City and County of Fresno and City of Bakersfield.

Economics

As described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008), the construction and operation of the HST System would have beneficial impacts on tax revenues and employment. The operation of the HST and other planned projects would increase the number of jobs and along with this, the increase in new homes, roadways, and infrastructure that are projected would result in beneficial cumulative economic effects for the three counties.

Environmental Justice

Populations within the study area are ethnically diverse and low-income. All but three of the census block groups within the study area have environmental justice populations, based on the high concentration of minority or low-income populations. The project would fully compensate and relocate displaced residents in equal or better housing, in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as amended. This would fully mitigate effects to residents; however, currently there is no replacement housing in Fairmead and Le Grand. This may require residents to relocate outside of their communities and, together with widening of SR 99 at Fairmead, the HST alternatives (primarily the UPRR/SR 99 Alternative) would result in a cumulative impact on these residents. However, there are available vacant lots in Fairmead where new housing could be constructed which would minimize the cumulative impact. The guideway between the Castle Commerce Center and the Downtown Merced Station would displace residents in Franklin-Beachwood. There are no other cumulative impacts from foreseeable projects on this community; therefore, cumulative impacts would be minimal.

In addition to the planned development needed to accommodate the population growth by 2035 under the No Project Alternative, the project would provide a cumulative benefit to environmental justice communities. The improved roadway network under the No Project Alternative and the addition of an HST alternative is anticipated to provide cumulative benefits for the public. These benefits include reduced traffic congestion on the existing highway system, connectivity of HST stations with local transit services, TOD, promotion of infill development, improved regional air quality, and improved accessibility for all populations, including communities of concern, to job markets, education, and social and health services.

Implementation of the HST System as a whole is not expected to result in disproportionately high and adverse effects on minority or low-income populations, as described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008). Systemwide, adverse effects on communities of concern would not be appreciably more severe or greater in magnitude than the adverse effects on non-communities of concern populations and therefore would not contribute to cumulatively considerable impacts.

Summary of NEPA/CEQA Impacts

The cumulative impact of the project and other reasonably foreseeable projects on neighborhoods and communities during construction would not be adverse except in the downtown areas of Merced and Fresno where the HST stations would be constructed. In these areas, cumulative construction impacts would be substantial under NEPA and cumulatively considerable under CEQA because of traffic and access changes and construction noise and dust. The cumulative construction effects on the local and regional economy would be beneficial because of the new jobs and other economic benefits created by multiple construction projects in combination with projected employment growth in the area. Cumulative construction impacts on communities of concern would not be appreciably more severe or greater in magnitude than effects on non-communities of concern populations; however, the cumulative impact could be a greater hardship for low-income residents and could result in disproportionately high and adverse effects on those residents.

Cumulative operations impacts would be beneficial for neighborhoods and communities because of increased access, reduced travel times, and the potential for economic development. Cumulative operations impacts on the unincorporated community of Franklin-Beachwood, however, could be substantial under NEPA and cumulatively considerable under CEQA because of the physical presence of the Castle Commerce Center HMF tracks and the Atwater-Merced Expressway in the community. Substantial economic benefits would occur under the cumulative condition as a result of projected and induced employment growth. The cumulative condition and the HST project are anticipated to provide cumulative benefits for the general public and environmental justice communities, including reduced traffic congestion, improved multimodal access and connectivity, economic development, and improved regional air quality.

Mitigation

The Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as amended, requires compensation for property owners for any property acquisition including housing of last resort. There are mitigation measures addressing community, and environmental justice populations for different resource areas (i.e., transportation, air quality, noise, and visual quality). Implement mitigation measures for the analyzed environmental resources to minimize impacts, thereby reducing cumulative impacts. While mitigation measures would reduce impacts, construction impacts around station areas and operations impacts in the Franklin-Beachwood community would still be substantial under NEPA and cumulatively considerable under CEQA. Mitigation measures are presented in Section 3.12.7.

Station Planning, Land Use, and Development

The No Project and HST alternative study area for the station planning and land use cumulative impacts analysis includes Fresno, Madera, and Merced counties.

Construction

Construction of the HST alternatives would require the acquisition of property and conversion of existing land uses to a transportation public right-of-way. This would reduce the amount of land available for development. The project and other foreseeable projects in the study area would cumulatively contribute to this land use conversion. However, the amount of land that would be acquired by these projects constitutes a small portion of the total residential, commercial, and public land that would be required to accommodate the projected 2035 population. Therefore, the HST alternative contribution to this cumulative impact would be negligible under NEPA and not cumulatively considerable under CEQA, and overall would be beneficial as an economic driver for densification in urban centers around the stations.

Short- and Long-Term Operations

Changes in transportation systems can influence nearby land uses either directly through acquisition or indirectly by providing new or improved access. Under the cumulative condition of the No Project Alternative, roadway improvements addressed in the regional transportation plans would reduce

congestion and shorten travel times. This has historically encouraged longer commutes and sprawling development. Because these projects are constrained by RTPs, the projects conform to existing planning documents. Future development projects under the No Project Alternative are anticipated to be implemented in compliance with local zoning and land use plans.

The cumulative effect of any of the HST alternatives on land use is minor compared to the projected 68% growth in population by 2035 under the No Project Alternative. Although the HST stations are anticipated to generate TOD that would result in more compact and efficient development, the amount of land within the influence of the HST stations would be small (approximately 125 acres within 0.25 mile and 480 acres within 0.5 mile of an HST station). This benefit may initially be modest compared to the 93,000 acres of development anticipated to accommodate the 2035 population; however, the HST Project may be an economic driver for increased densification in the future. Providing an important link to other economic centers makes the HST stations a focus area for economic investment and changes in land use patterns. Local land use planning agencies support an increase in density around the Downtown Merced and Downtown Fresno station areas.

The HST System as a whole could contribute to significant impacts associated with sensitive land uses—including in the Fresno to Bakersfield Section study area—as described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008). Where the HST System would be located in new rail corridors in residential areas and parks, or require widening of existing corridors in residential and commercial business areas, it could have a cumulatively considerable contribution to impacts on neighborhoods and communities. Where the alignment would be located within existing transportation rights-of-way, such as in the San Francisco to San Jose and the Oakland to San Jose corridors, it would be highly compatible with existing land uses. In areas such as the East Bay to Central Valley Corridor, the HST alternative alignments would have moderate land use compatibility due to the mix of land uses, including agricultural and residential lands. Implementation of segments of the HST System in new transportation corridors, such as the San Jose to Central Valley Corridor, would have the greatest land use incompatibilities.

Summary of NEPA/CEQA Impacts

The HST alternative contribution to cumulative construction impacts on land use due to land use conversion would be negligible under NEPA and not cumulatively considerable under CEQA, and overall would be beneficial as an economic driver for densification in urban centers around the stations. The cumulative operations impacts of the project and other reasonably foreseeable projects on land use planning would be beneficial under NEPA and CEQA because the HST project would influence densification, economic investments, and desired land use changes around stations.

Mitigation

Only local zoning and land use planning are required; no additional mitigation measures are required.

Agricultural Lands

The No Project and HST alternative study area for the cumulative analysis of agricultural lands includes Merced, Madera, and Fresno counties. These counties have been and continue to be important agricultural areas in California. Fresno and Madera counties are among the top five counties in the nation in terms of crop production. Farming and related agricultural industries are major employers in these counties and are vital to their economies.

Construction

Approximately 145 to 261 acres of Important Farmland would be leased for temporary use as laydown areas, staging areas, and concrete prefabrication yards during construction of the HST alternative. Construction of other past, present, and reasonably foreseeable projects could also result in the temporary conversion of farmland for construction-related uses. It is anticipated that this land would be restored and returned to agricultural use after construction is completed. Therefore, cumulative

construction impacts on farmland would be negligible under NEPA and not cumulatively considerable under CEQA.

Short- and Long-Term Operations

Approximately 1% of the Important Farmland and Grazing Land in Merced, Madera, and Fresno counties was converted to nonagricultural uses between 2000 and 2006. This trend is expected to continue in the future because more urbanization would continue to occur under the No Project Alternative. By 2035, an additional 23,200 acres of farmland is projected to be converted to urban uses. Although conversion to urban uses in many cases is consistent with local plans and policies that identify areas for planned future growth, loss of Important Farmland is substantial under NEPA and cumulatively considerable under CEQA for all HST alternatives. The HST alternatives would require the acquisition of up to approximately 1,453 acres of farmland, and conversion of farmland to nonagricultural uses is considered a cumulatively considerable impact.

The HST project would have a less than significant effect regarding Williamson Act conflicts. Most of the reasonably foreseeable projects identified are not under active Williamson Act contracts because they are within city spheres of influence that are planned for urbanization. Outside the sphere of influence of local jurisdictions, Williamson Act protections discourage the early conversion of agricultural lands. Although the Los Banos Bypass project would affect land contracted under the Williamson Act, those effects are not significant because the land required for the project would be removed from Williamson Act contracts, and the contracts would not be cancelled if minimum acreage requirements were met. Conflicts with Williamson Act contracts are not cumulatively considerable, and no additional mitigation is required.

As described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008), the HST System as a whole could have a significant impact on agricultural lands, therefore contributing to a cumulatively significant impact. Impacts would result from direct conversion of agricultural lands to transportation uses, as well as indirect loss resulting from division of agricultural parcels. Impacts would be greatest in the Central Valley, such as along the Merced to Bakersfield Section, and least in the urbanized corridors, such as the San Francisco to San Jose Section.

Summary of NEPA/CEQA Impacts

Construction impacts on farmland would be negligible under NEPA and not cumulatively considerable under CEQA because temporarily affected farmland would be restored and returned to agricultural use after construction is completed. Operations impacts on farmland would be substantial under NEPA and cumulatively considerable under CEQA because the cumulative condition would require acquisition and conversion of approximately 23,200 acres under the No Project Alternative and up to 1,453 acres under the HST alternatives. Conflicts with Williamson Act contracts are not cumulatively considerable because the effects of other projects would be less than significant or would not affect land contracted under the Williamson Act.

Mitigation

Implement mitigation measure provided in Section 3.14.6 to preserve the total amount of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland, thereby reducing cumulative impacts. However, even with the implementation of mitigation measures, farmland impacts would remain substantial under NEPA and cumulatively considerable under CEQA because of the large amount of farmland conversion.

Parks, Recreation, and Open Space

The No Project and HST alternative study area for the station planning and land use cumulative impacts analysis includes the cities of Atwater, Merced, Madera, and Fresno, and the unincorporated areas of Merced, Madera, and Fresno counties.

Construction

Construction of the HST alternatives would have substantial impacts on some parks and recreation resources in the Merced to Fresno Section because of partial or complete park closures. However, except for at Roeding Park, construction of other past, present, and reasonably foreseeable infrastructure and development projects would not physically alter parks in the Merced to Fresno Section, and construction-related cumulative impacts on parks would, therefore be negligible under NEPA and less than significant under CEQA.

Roeding Park would experience cumulatively considerable impacts from construction of the HST project, the Roeding Regional Park and Fresno Chaffee Zoo Facility Master Plan (City of Fresno 2011) renovations, and planned auxiliary lanes on SR 99 between Clinton Avenue and Fresno Street. The combination of impacts from these projects, which would include temporary closure of portions of the park, along with noise, dust, and visual changes within and immediately adjacent to the park, would be cumulatively substantial under NEPA and significant under CEQA.

Short- and Long-Term Operations

Under the No Project Alternative, demand for and use of most parks and recreation facilities has increased and will continue to increase in proportion to the population growth in the study area. To maintain the current quality of life, all of the communities will need to increase parkland to address the population forecast for 2035. The National Recreation and Park Association standards (Lancaster 1983) provide the following guidance for parkland:

1. Neighborhood parks – 2.5 acres per 1,000 population
2. District parks – 2.5 acres per 1,000 population
3. Large urban parks – 5.0 acres per 1,000 population

To accommodate the 2035 population increase of 932,000, approximately 9,300 acres of new parkland would be required. It is anticipated that the developers of new residential projects will be required to donate parkland as a condition of the entitlement process. This proportional increase in new parkland would mitigate the impact of new populations on existing parkland.

As described in Section 3.15, Parks, Recreation, and Open Space, the HST alternatives would have potential operational impacts on parks and recreation resources. Permanent property acquisition would range from approximately 0.6 to 14.5 acres, depending on the alternative and HMF selected. Reasonably foreseeable highway projects near the HST alternative could also affect parkland during operation. However, under Section 4(f), all impacts will be mitigated, including replacing park property or providing financial compensation to the jurisdictions for replacement park property.

Roeding Park in Fresno could experience impacts that are substantial under NEPA and cumulatively considerable under CEQA as a result of the projects proposed in the Roeding Regional Park and Fresno Chaffee Zoo Master Plan (City of Fresno 2011), which would convert an existing portion of the park to zoo and amusement park uses; planned auxiliary lanes on SR 99 between Clinton Avenue and Fresno Street, which would possibly encroach on the park; and the HST project, which would cause severe noise impacts along the eastern portion of the park without mitigation.

The cumulative impacts associated with the HST alternatives and foreseeable future transportation projects are negligible under NEPA and not cumulatively considerable under CEQA for remaining parks and recreational facilities in the Merced to Fresno Section. Mixed-use development projects, quarries, industrial projects, and other activities associated with the foreseeable projects and 2035 cumulative condition are not anticipated to involve the acquisition of parkland.

Because of the HST connections to major economic centers, the project could result in an increase in population and the demand for park and recreation facilities in the communities with HST facilities. However, this increase is insignificant compared to the projected population growth without the project

(Authority and FRA 2008). The developers of new TOD projects would be required to contribute park facilities as part of the entitlement process.

As described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008), the HST System would have cumulatively significant impacts on parks, recreation, and open space when viewed on a systemwide basis. Although some parks along the right-of-way could be avoided, the 2005 Statewide Program EIR/EIS and 2008 Bay Area to Central Valley Program EIR/EIS determined that due to the program-level analysis and uncertainty in avoiding parks, this impact would be significant.

Summary of NEPA/CEQA Impacts

The cumulative construction and operations impacts of the project and other reasonably foreseeable projects on parkland projects would be negligible under NEPA and not cumulatively considerable under CEQA for all parks except Roeding Park in Fresno because other projects would not physically alter these parks, and new developments would be required to provide new parks to meet the demands of a growing population.

Cumulative construction and operations impacts on Roeding Park would be substantial under NEPA and cumulatively considerable under CEQA because of multiple planned projects in an around the park that would cause temporary and permanent closure of portions of the park, along with noise, dust, and visual changes.

Mitigation

Implement mitigation measures for parks, recreation, and open space provided in Section 3.15.6 to minimize impacts, thereby reducing cumulative impacts. If mitigation to address noise at Roeding Park is implemented, cumulative impacts at the park would still likely be substantial under NEPA and cumulatively considerable under CEQA because of the impacts resulting from the Roeding Regional Park and Fresno Chaffee Zoo Master Plan (City of Fresno 2011) and planned auxiliary lanes on SR 99 between Clinton Avenue and Fresno Street.

Aesthetics and Visual Quality

The project is located in an area visually characterized by the intersection of large- and medium-size agricultural operations, with steadily growing urban and suburban areas near the cities of Merced, Chowchilla, Madera, and Fresno. The most significant visual resources in the project vicinity (identified by using aerial and satellite maps, site surveys, and a review of policy documents) include designated scenic corridors in the cities of Atwater, Merced, and Chowchilla; parks and historically significant sites in the central areas of the cities of Merced, Madera, and Fresno; the San Joaquin River north of Fresno; and views toward the Sierra Nevada Mountains from Merced County.

The No Project and HST alternative study area for the cumulative analysis of aesthetics and visual resources is referred to as the potential viewshed (i.e., the area that could potentially view the proposed project features and the area that could be potentially viewed from the project). Accounting for the existing terrain, predominant land uses, and proposed elevated areas, the potential viewshed for the Merced to Fresno Section of the HST System is 0.25 mile on both sides of the alignment centerline in urbanized areas, including all of Fresno, and 0.5 mile on both sides of the alignment centerline in the agricultural areas between cities.

Construction

Construction activities would create temporary visual changes from demolition, vegetation removal, construction staging areas, construction lighting, and general construction activities. Construction can have a moderate but temporary cumulative visual impact where multiple projects are under construction in the same area. This could occur along SR 99 and in urban areas where HST stations and other infrastructure and development projects would be under construction in a large area for multiple years.

In these areas, cumulative visual impacts of construction would be moderate under NEPA and cumulatively considerable under CEQA.

As described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008), the HST system as a whole would create short-term construction-related visual changes from the construction of 700 miles to 750 miles of a new transportation system that would be visible along many major highways and rail corridors in the state, and would be cumulatively considerable.

Short- and Long-Term Operations

Under the No Project Alternative, seven of the reasonably foreseeable projects proposed within the project study area would be located within the project's composite viewshed. Other visual impacts under the No Project Alternative are less easily defined, but relate to the conversion of 88,000 acres of vacant and agricultural land to urban uses. All of the transportation projects are within existing transportation corridors where viewer sensitivity is low; however, a larger roadway could have an indirect impact by incrementally degrading visual quality.

The HST project would result in cumulative visual quality benefits in areas surrounding stations, such as visually iconic stations with landscaped plazas. There may be secondary visual benefits as the HST stations attract new development in the urban centers of Merced and Fresno. Other areas of the guideway would not provide the same opportunities without mitigation.

Generally, in open viewsheds along SR 99, the HST guideway would be at-grade and would not block scenic views. However, the elevated guideways may result in significant impacts on aesthetics and visual resources at the following general locations:

- The areas east and west of SR 99 along the Avenue 21 and Avenue 24 wyes, where elevated roadway crossings of the at-grade HST alignments would be necessary; and specifically along West Robertson Boulevard (SR 233) from SR 99 to SR 152 in Chowchilla, which is a locally designated scenic corridor.
- Established residential communities in the area between Chowchilla and Madera, including Fairmead.
- Residential neighborhoods in the community of Le Grand.
- Residential neighborhoods in the community of Madera Acres.
- Locations west of the HST alignment and between the communities of Le Grand and Madera Acres, from which there are panoramic views to the east.

Approximately one-half of the distinct lengths of HST corridor under each HST alternative would have permanent and significant impacts on aesthetics and visual resources. The HST project and other foreseeable projects would result in a cumulative impact; however, it would be moderate under NEPA and not cumulatively considerable under CEQA, because these viewsheds generally have moderate to low visual quality, and viewer sensitivity is not high.

As described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008), the HST System as a whole could have a significant impact on aesthetics. The HST System would create long-term visual changes from the introduction of 700 miles to 750 miles of a new transportation system that would be visible along many major highways and rail corridors in the state, and would be cumulatively considerable. For example the loss of mature trees within the HST System footprint in several cities on the San Francisco peninsula would result in substantial changes in visual character. Changes in highly scenic areas, such as scenic open space and mountainous areas, would be also significant. For example, the potential stations at Pleasanton (I-680/Bernal Road), Pleasanton (BART), Livermore (I-580), Livermore (I-580 Greenville

Road), Tracy (Downtown), Tracy (ACE), Union City (Shinn), and San Jose (Diridon) in the San Francisco to San Jose Section could have significant visual impacts.

Summary of NEPA/CEQA Impacts

Construction visual impacts in areas such as HST station areas and along SR 99, where multiple infrastructure and development projects would be under construction for multiple years, would be moderate under NEPA and cumulatively considerable under CEQA. Cumulative operations visual impacts in areas surrounding HST stations would be beneficial, resulting from visually iconic stations and new development. Operations visual impacts in other areas, away from stations, would be moderate under NEPA and not cumulatively considerable under NEPA because visual changes would occur in viewsheds with moderate to low visual quality and lower viewer sensitivity.

Mitigation

Implement mitigation measures for visual resources provided in Section 3.16.6 to minimize impacts, thereby reducing cumulative impacts. Even with the implementation of mitigation measures for the HST project, construction visual impacts would remain moderate under NEPA and cumulatively considerable under CEQA.

Cultural and Paleontological Resources

The No Project and HST alternative study area for the cumulative analysis of archaeological and historical architectural resources is the project area of potential effects (as described in Section 3.17.3). The study area for paleontological resources includes the project property acquisition footprint plus a 250-foot buffer. In both cases, the study area also includes the geographic area that contains the other proposed projects that are part of the cumulative project scenario.

Construction

Prehistoric sites are common in riverbank and floodplain areas, and burial sites are sometimes encountered during ground-disturbing activities. It is likely that known and unknown archaeological resources could be disturbed and cultural resources damaged or destroyed during project construction activities. Significant and unavoidable losses of unique archaeological resources (as defined in Public Resources Code Section 21083.2) or a historical resource (as defined in Section 21083.2 of CEQA and Section 15064.5 of the state CEQA guidelines) could occur when excavations encounter archaeological deposits that cannot be removed or recovered (e.g., under levees) or where recovery would not sufficiently prevent the loss of significant cultural resources. If such permanent losses occurred, cumulative construction impacts would be moderate under NEPA and cumulatively considerable under CEQA.

Short- and Long-Term Operations

Under the No Project Alternative, three reasonably foreseeable projects could affect cultural resources. The Tesoro Viejo Specific Plan (for the area approximately 10 miles northeast of the project) would potentially affect a burial area. The Madera County Dairy Standards Programmatic Final EIR (Madera County 2008) states that this project has the potential to affect cultural resources. The cultural resource impacts of these projects would be significant or significant and unavoidable. The Roeding Regional Park Master Plan and Fresno Chaffee Zoo Facility Master Plans (City of Fresno 2011) would affect cultural resources in the Roeding Park Historic District, but these effects would be less than significant after mitigation.

Future growth under the No Project Alternative would result in the urbanization of land outside of existing urban areas but within urban spheres of influence. Historical architectural resources could also be damaged or require removal from areas in and around the study area. Furthermore, local projects and the secondary effects of redevelopment pressures around the HST stations would potentially result in the removal of historical buildings in Downtown Merced and Downtown Fresno. If these resources meet the

definition of a historical resource or a historic resource (as defined in Section 106, 36 CFR 800), their modification or destruction would be significant. Although the implementation of mitigation measures would reduce the effects on significant cultural resources, significant impacts may still occur. There could be a loss of significant cultural artifacts, and due to this likelihood, cumulative impacts would be moderate under NEPA and cumulatively considerable under CEQA.

As described in the 2005 Statewide Program EIR/EIS (Authority and FRA 2005) and the 2008 Bay Area to Central Valley Program EIR/EIS (Authority and FRA 2008), the HST System as a whole could have a significant impact on archaeological resources, historical structures, and paleontological resources and therefore contribute to a cumulatively considerable impact. Potential impacts would likely occur in areas that cross formations with paleontological sensitivity, such as the Colma Formation (San Francisco to San Jose Section), and in areas where the HST alternative alignments use existing rail corridors, as these corridors and potential stations in urban centers typically are surrounded by historical structures and districts, such as the potential stations in Redwood City, Palo Alto, and Mountain View.

Summary of NEPA/CEQA Impacts

The cumulative construction and operations impacts of the project and other reasonably foreseeable projects on cultural resources would be moderate under NEPA and cumulatively considerable under CEQA because of the high likelihood of permanent loss of archaeological and cultural resources.

Mitigation

Minimize cumulative impacts on cultural resources by adhering to federal, state, and local regulations and providing guidance on the treatment of significant properties (as defined in CEQA Section 106 and regional evaluation criteria). Implement mitigation measures for cultural resources discussed in Section 3.17.6 to minimize impacts, thereby reducing cumulative impacts. Although implementation of mitigation measures can reduce cumulative impacts, it cannot avoid them entirely, and impacts on archaeological and cultural resources would remain moderate under NEPA and cumulatively considerable under CEQA.