Chapter 4
Other CEQA-Required Analysis

4.1 Introduction

This chapter provides additional analyses and information required under the California Environmental Quality Act (CEQA) and includes the following.

- Cumulative Impact Analysis
- Significant and Unavoidable Environmental Impacts of the Proposed Project
- Significant and Irreversible Environmental Challenges
- Growth-Inducing Impacts
- Public Agency Involvement
- List of Preparers

4.2 Cumulative Impacts

The focus of the cumulative analysis is to identify the Project's contribution to significant cumulative impacts and to determine whether that contribution would be considerable. This cumulative impact analysis uses the term "Project" when referring to the Proposed Project and the alternative analyzed at an equal level of detail (i.e., the Atwater Station Alternative).

When cumulative impacts on a resource affected by Project can be clearly shown to be less than significant, and when the Project would have no impact on a resource or can be clearly shown to make a less-than-considerable contribution to a cumulative impact, the discussion of cumulative impacts is brief. When the Project is likely to contribute considerably to a significant cumulative impact, the analysis provides more detail. The cumulative analysis focuses on the Project's potential contribution to the cumulative impact rather than a detailed description of the cumulative impact itself.

4.2.1 CEQA Requirements

CEQA Guidelines define a cumulative impact as two or more individual impacts that, when considered together, are considerable or that compound or increase other significant environmental impacts. The incremental impact of a project may be considerable when viewed in the context of other closely related past, present, and reasonably foreseeable probable future projects.[1] Cumulative impacts can result from individually minor, but collectively significant, projects taking place over a period of time (CEQA Guidelines Section 15355).

[1] *Reasonably foreseeable future projects* are defined as projects that have been adopted or have otherwise demonstrated likelihood to occur based on documentation from project sponsors.

CEQA Guidelines Section 15130(b) indicates that an adequate discussion of potential cumulative effects requires consideration of either a list-based approach or a projection-based approach. This EIR uses a combination of a list-based approach and a projection-based/plan-based approach to determine whether significant cumulative impacts would occur.

Under CEQA, the San Joaquin Regional Rail Commission (SJRRC) is not responsible for mitigating overall cumulative impacts. SJRRC is only responsible for identifying and implementing potentially feasible mitigation to address the Project's considerable contributions to identified significant cumulative impacts. Thus, the obligation to assess mitigation is limited to the *fair share*[2] portion of a significant cumulative impact that is due to the Project's considerable contribution. Other cumulative projects have a similar obligation for their contributions to significant cumulative impacts.

4.2.2 Approach and Methodology

Section 15130(b) of the State CEQA Guidelines states that the discussion of cumulative impacts should include the following.

- Either (1) a list of past, present, and probable future projects producing related or cumulative impacts, or (2) a summary of projections contained in an adopted general plan or similar document, or in an adopted or certified environmental document, that described or evaluated conditions contributing to a cumulative impact.
- A description of the geographic scope of the area affected by the cumulative impact.
- A summary of expected environmental effects to be produced by these projects.
- Reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

This EIR uses a hybrid approach, consisting of a combination of the list-based and projection-based (plan-based) approaches, to best identify cumulative impacts. Table 4-1 summarizes the methodology used for each cumulative subject analysis as well as the geographic area of analysis.

- **Projection Approach:** This approach discloses regional cumulative impacts related to air quality, greenhouse gas (GHG) emissions, population and housing, public services, recreation, safety and security, transportation, and utilities and service systems.
- **List Approach:** The Project and specific cumulative projects in or adjacent to the Project corridor were examined for the potential to result in cumulatively significant localized impacts. This analysis considers transportation projects proposed within the Project corridor between Ceres and Merced, as well as directly adjacent planned land development projects. The cumulative analysis uses this approach to identify localized impacts related to aesthetics, agricultural resources, air quality, biological resources, cultural resources, energy resources, geology and soils, GHG emissions, hazardous materials, hydrology and water quality, land use and planning, noise and vibration, public services, recreation, safety and security, transportation, and utilities and service systems.

[2] *Fair share* in this context refers to the portion of the cumulative impact to which a project contributes, and which a project would also be responsible for mitigating.

As described in Chapter 3, *Environmental Impact Analysis*, the Project would have no impact on forestry resources. Because the Project would have no impact on forestry resources, it cannot contribute to any potential cumulative impacts on forestry resources. The topic of forestry resources is, therefore, not discussed further in this chapter.

As described throughout Chapter 3, *Environmental Impact Analysis*, the Project would have little to no impact along the existing ACE corridor from Stockton to San Jose. As discussed in Chapter 2, *Project Description,* the Project would require additional connecting ACE shuttles at the Great America Station and Pleasanton Station to accommodate the increased ridership at these stations form the Project. This Project includes added ACE shuttle service that would be commensurate with added ACE ridership at these stations. As discussed in Section 3.3, *Air Quality*, the additional ACE shuttles at the Pleasanton and Great America Stations would have less than significant air pollutant emissions measured by thresholds designed to assess cumulative contributions, in particular taking into account the net reduction of air pollutants in the BAAQMD with Project implementation. Separate from air quality associated with ACE shuttles, the Project would have no adverse environmental effects along the existing ACE service corridor from Stockton to San Jose, and thus the potential for Project contributions to cumulative effects in the Bay Area are not analyzed further.

Table 4-1. Summary of Cumulative Impact Methodology

Resource Issue	Cumulative Method	Geographic Area of Impact
Aesthetics	List	Project corridor and vicinity
Agricultural resources	List	Project corridor and vicinity
Air quality	• Projection (criteria pollutants) • List (toxic air contaminants)	• Criteria pollutants: San Francisco Bay Area Air Basin and San Joaquin Valley Air Basin • Toxic air contaminants: Project corridor and immediate vicinity
Biological resources	List	• Terrestrial species: Project corridor and immediate vicinity • Aquatic species: Project corridor, vicinity, and downstream waterbodies
Cultural resources	List	Project corridor and vicinity
Energy resources	List	Service areas of the energy providers to the Project corridor
Geology and soils	List	Project corridor and vicinity
GHG emissions	Projection	GHG emissions: regional and global
Hazardous materials	List	Project corridor and vicinity
Hydrology and water quality	List	Project corridor, vicinity, and downstream waterbodies
Land use and planning	List	Project corridor and vicinity
Noise and vibration	List	Project corridor and vicinity
Population and housing	Projection	Stanislaus and Merced Counties
Public services	• List (construction disruption) • Projection (operations)	• Construction disruption: Project corridor and immediate vicinity • Operation: Service areas of the public service providers to the Project corridor

Resource Issue	Cumulative Method	Geographic Area of Impact
Recreation	• List (construction disruption) • Projection (operations)	• Construction disruption: Project corridor and immediate vicinity • Recreational demand: Jurisdictions that provides recreational resources in the vicinity of the Project corridor
Safety and security	• List	Project corridor and vicinity
Transportation	• List (construction analysis and transportation improvements) • Projection (operational impacts and VMT)	• Construction disruption: Project corridor and immediate vicinity • Local transportation facilities: pedestrian, bicycle, and transit • Regional traffic and transit systems: San Francisco Bay Area and San Joaquin Valley
Utilities and service systems	• List (construction disruption) • Projection (operations)	• Construction disruption: ACE Extension corridor and immediate vicinity • Operation: Service areas of the utility and service system providers to the ACE Extension corridor

4.2.3 Projections/Regional Growth Characteristics

To estimate overall growth, the cumulative analysis uses multiple land use and population growth projection sources for the jurisdictions that the Project has the potential to affect (Table 4-2). Growth projections for Stanislaus, and Merced Counties originate from data provided by the California Department of Finance (California Department of Finance 2019) and the Eberhardt School of Business (Eberhardt School of Business 2016a, 2016b).

Table 4-2. Existing and Projected Population and Housing Unit Growth in the Counties of the Project Corridor

	Total Population			Total Housing Units		
County	2015	2040	2015–2040 Difference (%)	2015	2040	2015–2040 Difference (%)
Stanislaus	537,658	650,911	21.1	184,163	244,176	32.6
Merced	269,522	374,210	38.8	85,530	123,530	44.4

Sources: California Department of Finance 2019; Eberhardt School of Business 2016a, 2016b

4.2.4 Projects Considered

This analysis considers cumulative impacts of three types of projects: rail projects planned within or along the Project corridor; other regional transportation improvements; and land development adjacent to the Project corridor. For land development along the Project corridor, the SJRRC requested lists of reasonably foreseeable projects from counties and cities along the Project corridor, and additional projects were added based on general knowledge. The geographic study areas considered for cumulative impact analyses vary by individual resource and can include different scales of impact (such as for criteria pollutants or GHG emissions). The resource-specific study area is noted in Table 4-1 and at the beginning of each resource analysis in this EIR. Tables 4-3, 4-4, and 4-5 summarize the projects that are considered in this cumulative analysis.

4.2.4.1 Rail Projects Planned within the Project Corridor

Table 4-3 summarizes the rail projects that are planned within the Project corridor. The project reference numbers in Table 4-3 correspond to the project numbers shown in Figure 4-1, which depict the approximate location of each project with respect to the Project corridor.

Table 4-3. Rail Projects Planned within the Project Corridor Considered in the Cumulative Analysis

Project Name (Reference Number)	Description	Estimated Construction Schedule	Location	Location relative to Project	Potential Conflict [a]
ACE Extension Lathrop to Ceres (#1)	Extension of ACE commuter service between Lathrop and Ceres (Phase I)	Phase I is estimated to be constructed between 2021 and 2023	Lathrop to Ceres	Overlaps (near Ceres)	None
Valley Rail Sacramento Extension Project (#2)	New passenger rail service to Sacramento from the San Joaquin Valley	Operational as early as 2023	Stockton to Sacramento	No Overlap	None
California High-Speed Rail (Merced to Fresno Section and Merced to Sacramento Section) (#3)	High speed rail Interim Operating Segment (IOS) service between Merced and Bakersfield; Valley to Valley service between San Francisco and Bakersfield; Phase I service between San Francisco and Los Angeles; and Phase II service extended to both Sacramento and San Diego	Construction is underway for the IOS. Based on the CHSRA Revised 2020 Business Plan, interim service may commence in 2029; Valley to Valley service may commence in 2031; and Phase I service may commence in 2033, but completion of construction and operations is pending funding availability. No schedules have been identified for Phase II.	Northern California, Central Valley, Southern California	Potential overlap with the Project at Merced [b]	None
Valley Link (#4)	New passenger rail service between the existing Dublin/ Pleasanton Bay Area Rapid Transit (BART) Station and the approved ACE North Lathrop Station.	Operational as early as 2028	Lathrop to Dublin/ Pleasanton	No Overlap	None
Freight Rail Future Plans (#5)	Increased Freight	Incremental over time; specific timing unknown	California	Overlaps with Project corridor from Ceres to Merced	None

Project Name (Reference Number)	Description	Estimated Construction Schedule	Location	Location relative to Project	Potential Conflict [a]

Sources: San Joaquin Regional Rail Commission 2018a and 2018b; California High Speed Rail Authority 2005 and 2020; Tri-Valley – San Joaquin Valley Regional Rail Authority 2020.

[a] The potential conflict column refers to the potential conflicts between the Project and the cumulative projects identified in this table.

[b] The California High-Speed Rail Authority (CHSRA) included an HSR station in Merced located adjacent to the UPRR Fresno Subdivision between G Street and Martin Luther King Jr. Way. As discussed, in Chapter 2, *Project Description,* the proposed ACE Merced Station is at the location preferred by the City of Merced, and the City has urged CHSRA to relocate its adopted station to this location as well (see further discussion in text below). If CHSRA later decides to move its station to the City-preferred location, then the new ACE station and HSR station would be adjacent to each other. If CHSRA chooses to keep its station at the previously approved location, then the ACE station and the HSR station would be approximately 0.5 mile apart and passengers transferring from one system to the other would either walk or potentially use a shuttle.

ACE Extension Lathrop to Ceres Project (1)

This is project reference 1 in Table 4-3 and on Figure 4-1. To enhance intercity and commuter rail service and to promote greater transit connectivity between the Central Valley and the San Francisco Bay Area, the SJRRC, which manages the ACE service is proposing to expand ACE service from Lathrop to Ceres. The ACE Extension Lathrop to Ceres Project has completed its CEQA review and construction is expected to commence between 2021 and 2023. The ACE Extension Lathrop to Ceres Project would connect with the Project at Ceres (San Joaquin Valley Regional Rail Commission 2018a).

Valley Rail Sacramento Extension Project (2)

This is project reference 2 in in Table 4-3 and on Figure 4-1. The San Joaquin Joint Powers Authority (SJJPA), which manages the San Joaquin service and SJRRC, which manages the ACE service are jointly undertaking the planning, design, and environmental review of the Valley Rail Sacramento Extension project. This project proposes a new passenger rail service to Sacramento from the San Joaquin Valley. This service would include stations in Lodi, Elk Grove, and four stops in Sacramento at Sacramento City College, Midtown, Old North Sacramento, and Natomas (with potential shuttle service to the Sacramento International Airport).

Preliminary plans include an increase in San Joaquin service by three daily roundtrips between the existing Amtrak Fresno Station and the proposed Natomas Station, as well as up to five new roundtrips operated by SJRRC between the existing ACE Stockton Station and the proposed Natomas Station.

The Valley Rail Sacramento Extension project would not physically overlap with the Valley Link corridor. However, the Valley Rail Sacramento Extension project would connect to the existing ACE system at the proposed North Lathrop Station. Based on current planning, the extension to Sacramento is expected to be operational in 2023 (San Joaquin Valley Regional Rail Commission 2018b).

LEGEND

- Interstate Highway (680)
- U.S. Highway (101)
- State Route (82)
- Local Road
- Existing Railroads
- County Line

PROJECTS CONSIDERED IN THE CUMULATIVE ANALYSIS

(See Table 5-3 for names associated with the project numbers)

- ## — Rail Projects Planned within the ACE Ceres-Merced Extension Corridor
- ## — Other Regional Improvements
- ## — Land Development Adjacent to the ACE Ceres-Merced Extension Corridor

ACE CORRIDOR FEATURES

- Ceres to Merced Extension Alignment
- (S) Planned Ceres Station (CEQA Completed)
- (S) Proposed Station
- (S) Atwater Station Alternative
- Name — Project Facility

N

0 1 2 3 4 5 6
Miles

Note: This figure shows two potential routes for HSR future Phase II extension from Merced to Sacramento (the preferred alignment along the UPRR alignment and a study alignment along the BNSF alignment).

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ACE ALTAMONT CORRIDOR EXPRESS

Figure 4-1
Projects Considered in the Cumulative Analysis
ACE Ceres-Merced Extension Project

California High-Speed Rail System (3)

The statewide HSR system planned for California would encompass over 800 miles of rail, with up to 24 stations. The project has been broken into 10 separate sections and the California High-Speed Rail Authority (CHSRA) previously prepared a program-level environmental analysis for the statewide HSR system (California High-Speed Rail Authority 2005). The program-level analysis included an evaluation of various alignments for the 10 sections. Each separate section has undergone, is undergoing or will undergo a subsequent project-level analysis prior to project approval and construction. The HSR sections that are within the Project corridor are described below. This project is project number 3 in Table 4-3 and Figure 4-1.

As proposed, the Phase II Merced to Sacramento section of the California high-speed rail system would be within a 120-mile corridor from downtown Sacramento to Merced. For the Merced to Sacramento section, the California High-Speed Rail Authority's 2008 *Final Program Environmental Impact Report/Environmental Impact Statement* selected the UPRR corridor as the preferred alignment for the high-speed rail route from Sacramento south to Merced, indicated that the BNSF corridor should also continue to be studied, identified a preferred downtown Merced Station, and identified a preferred location for a maintenance facility at Castle Air Force Base north of Merced (California High-Speed Rail Authority 2008). This was confirmed in the Revised Final Program EIR in 2010 (California High-Speed Rail Authority 2010) and the Partially Revised Final Program EIR in 2012 (California High-Speed Rail Authority 2012). The Merced to Sacramento section is currently planned to have dedicated tracks.

The Merced to Fresno section of the California HSR system is an approximately 65-mile corridor running from the HSR Merced Station to the HSR Fresno Station, where the system would connect to the Fresno to Bakersfield section. The Merced to Fresno section would be the linkage between the Bay Area and Sacramento portions of the HSR system and, upon completion, would be part of the 540-mile Phase I system. The CHSRA Board selected the "Hybrid" route as the preferred alternative out of the three primary alternatives studied during the project-level EIR/environmental impact statement (EIS) process. The Hybrid Alternative alignment generally parallels the Union Pacific Railroad (UPRR) tracks and State Route (SR) 99 between Merced and Fresno.

CHSRA included an HSR station in Merced located adjacent to the UPRR Fresno Subdivision between G Street and Martin Luther King Jr. Way. However, as discussed in in Chapter 2, *Project Description,* the City of Merced has identified that it would prefer that both the ACE Station and the HSR station be at a more northerly location, nominally in closer proximity to the Merced Transit Station, which is on 16th Street between N Street and O Street. The City prefers a more northerly location because it would have greater transit-oriented development potential, would extend the revitalization of downtown Merced to the northeast providing a catalyst for further economic development, would avoid relocation of the central City Fire Station, would be less disruptive to historic buildings in the downtown, would avoid disruption to City's recent investments in G Street which is the primary emergency route to Dignity Health, and would avoid disruption in areas due to roadway crossing relocations necessary for the more southerly location. The proposed ACE Merced Station is at the location preferred by the City of Merced, and the City has urged CHSRA to relocate its adopted station. If CHSRA decides to move its station to the City-preferred location, then the new ACE station and HSR station would be adjacent to each other. If CHSRA chooses to keep its station at the previously approved location, then the ACE station and the HSR station would be approximately 0.5 mile apart and passengers transferring from one system to the other would either walk or potentially use a shuttle.

For the environmental analysis of the Project, the ridership analysis does not include the HSR project's effect on ACE ridership (or vice versa). There are several reasons for doing this, including the following:

- Since the HSR project would likely increase ACE ridership between Merced and Lathrop, the conservative way to analyze criteria pollutant emissions, greenhouse gas emissions, and energy is to assume all the train emissions associated with the ACE trains to Merced for 2040 but to exclude any additional reduction of passenger vehicle emissions due to the additional ridership that might result due to transfers between ACE and HSR.
- While HSR service to Merced is an adopted project, the exact timing and frequency of HSR service to Merced is still a work in progress.
- This EIR sought to identify the impacts and benefits of the Project on its own as a separate independent utility project from HSR and that is best done by not including any potential ridership effects due to transfers between ACE and HSR.

Increased ridership due to transfers between ACE and HSR could also influence the demand for parking at ACE stations between Ceres and Merced. This potential demand was not estimated or included in the EIR for several reasons, including the following:

- The timing and frequency of HSR service to Merced is still a work in progress and thus it is premature to estimate demand and preliminary to make decisions about parking facilities.
- The Project includes ample parking to meet ACE demand out to 2040, which means that if HSR service to Merced starts much earlier than 2040, then there would be some additional parking capacity at ACE stations leading up to 2040.
- Given that ACE stations are located in the center of towns, the station locations provide the greatest opportunities for use of transit, being in close proximity to downtown land uses, and the utilization of car sharing. Given these factors, SJRRC may decide to not add more parking in the future depending on the actual transit, access, and car share conditions many years in the future.

Given all the above, SJRRC has decided to commit to meeting the ACE parking demand out to 2040, to let the plans for the HSR Merced Station solidify along with the timing for the completion of the IOS and initiation of service to Merced, to see how access and transit are working at the Project stations after opening, and to then assess the parking demand and whether or not to expand parking. If SJRRC decides at a future time to consider expanding parking beyond what is assessed in this EIR, then SJRRC will comply with all requirements of CEQA for environmental analysis prior to making any final decisions.

Valley Link Project (4)

This is project number 4 in Table 4-3 and Figure 4-1. The Tri-Valley–San Joaquin Valley Regional Rail Authority proposes to establish new passenger rail service along a 42-mile corridor between the existing Dublin/Pleasanton Bay Area Rapid Transit (BART) Station and the approved ACE North Lathrop Station. The Valley Link Project would not physically overlap with the Project. The Valley Link Project would, however, connect to the ACE system at the North Lathrop Station. The Draft EIR for the Valley Link Project was released in December 2020 and the Valley Link Project is expected to be operational as early as 2028 (Tri-Valley – San Joaquin Valley Regional Rail Authority 2020).

For the environmental analysis of the Project, the ridership analysis does not include the Valley Link Project's effect on ACE ridership (or vice versa). There are several reasons for doing this, including the following:

- The Valley Link Project is not yet formally approved but may be approved in Spring 2021.
- The Valley Link Project is not yet fully funded and may be built in phases from west to east.
- Since the Valley Link Project would likely increase ACE ridership between Merced and Lathrop, the conservative way to analyze criteria pollutant emissions, greenhouse gas emissions, and energy is to assume all the train emissions associated with the ACE trains to Merced for 2040 but to exclude any additional reduction of passenger vehicle emissions due to the additional ridership that might result due to transfers between ACE and Valley Link.
- This EIR sought to identify the impacts and benefits of the Project on its own as a separate independent utility project from the Valley Link Project and that is best done by not including any potential ridership effects due to transfers between ACE and Valley Link.

Increased ridership due to transfers between ACE and Valley Link could also influence the demand for parking at ACE stations between Ceres and Merced. This potential demand was not estimated or included in the EIR for several reasons, including the following:

- The Valley Link Project is not fully funded.
- The timing and frequency of Valley Link service to Lathrop is still a work in progress and thus it is premature to estimate demand and preliminary to make decisions about parking facilities.
- The Project includes ample parking to meet ACE demand out to 2040, which means that if Valley Link service to Merced starts much earlier than 2040, then there would be some additional parking capacity at ACE stations leading up to 2040.
- Given that ACE stations are located in the center of towns, the station locations provide the greatest opportunities for use of transit, being in close proximity to downtown land uses, and the utilization of car sharing. Given these factors, SJRRC may decide to not add more parking in the future depending on the actual transit, access, and car share conditions many years in the future.

Given all the above, SJRRC has decided to commit to meeting the ACE parking demand out to 2040, to let the plans for the Valley Link service to Lathrop solidify along with the timing and frequency of service, to see how access and transit are working at the Project stations after opening, and to then assess the parking demand and whether or not to expand parking. If SJRRC decides at a future time to consider expanding parking beyond what is assessed in this EIR, then SJRRC will comply with all requirements of CEQA for environmental analysis prior to making any final decisions.

Freight Rail Future Plans (5)

This is project number 5 in Table 4-3 and Figure 4-1. The *California Freight Mobility Plan 2020* (California Department of Transportation 2020a) defines the UPRR Fresno Subdivision on which the Project would operate as a major freight facility. As required by the National Highway Freight Program (NHFP) established by the federal Fixing America's Surface Transportation Act, all states must develop a freight investment plan (FIP), including a list of priority projects, by December 4, 2017, to receive NHFP funding. However, the identification of priority projects under the state FIP has been postponed with the passage of Senate Bill (SB) 1, which created the Trade Corridor

Enhancement Program (California Transportation Commission 2019). Additional legislation has been approved with the passage of SB 103, which provides more specific direction on the implementation on the Trade Corridor Enhancement Program funds and combines the federal NHFP funds into this new program. As such, no specific freight rail projects have been identified.

Table 4-4 summarizes the existing cumulative rail service and assumed future service along the Project corridor by 2040 based on review of the *2018 California State Rail Plan* (California Department of Transportation 2018) and project documents for the cumulative rail projects described in the previous sections of this chapter.

Table 4-4. Cumulative Existing (2016) and Future (2040) Daily Train Service in the Project Corridor

	Lathrop to Ceres	**Ceres to Merced**	**Stockton to Merced**
System	*UPRR Fresno Subdivision*	*UPRR Fresno Subdivision*	*BNFS Stockton Subdivision*
Existing (2016) Service			
ACE	0	0	0
San Joaquin[a]	0	0	14
Freight[b]	22	22	28
Total	**22**	**22**	**42**
Future (2040) Service			
Existing ACE	0	0	0
Existing San Joaquin[a]	0	0	14
ACE Extension to Ceres	8	0	0
ACE Extension to Merced	0	8	0
Valley Rail: Additional San Joaquin[a]	0	0	4
Freight[b]	40	40	54
Total[a]	**48**	**48**	**72**
Change from 2016	**+26**	**+26**	**+30**

UPRR = Union Pacific Railroad

Notes:

[a.] The San Joaquin service operates on the BNSF alignment between Stockton and Merced which is located eastward and distant from the UPRR alignment where ACE would operate between Lathrop and Merced. As such, San Joaquin trains and ACE trains, with the proposed extensions to Ceres and Merced would not affect the same localized receptors relative to noise and localized air quality. San Joaquin service is included only for consideration of regional air quality emissions and GHG emissions in this cumulative analysis.

[b.] Existing and forecasted freight totals are based on the 2018 State Rail Plan. Existing totals are for 2013. The ACE Ceres-Merced Extension will not change the number of freight trains.

4.2.4.2 Other Regional Transportation Improvements

Major Highway Improvements

These improvements are grouped together as project number 6 in Table 4-5 and Figure 4-1. In the face of rapid growth in the Central Valley, a variety of highway improvements are planned and are included in the following transportation planning documents.

- *2018 Regional Transportation Plan/Sustainable Communities Strategy* (Stanislaus Council of Governments 2018).
- *Regional Transportation Plan/Sustainable Communities Strategy for Merced County* (Merced County Association of Governments 2018).

Major planned highway improvements that are within 0.25 mile of the Project corridor are as follows.

- SR 99/Service Road/Mitchell Road Interchange Project would construct a full interchange in a diverging diamond configuration at Service Road and upgrades to the current Mitchell Road Interchange. The Project could be completed by 2027 (Stanislaus Council of Governments 2018 and Holland 2020).
- SR 99/Taylor Road Interchange Project would reconstruct the existing interchange in Turlock. The Project would be open to traffic in 2030 (Stanislaus Council of Governments 2018).
- The Stanislaus Council of Governments RTP/SCS identifies a Project to make Golden State Boulevard into a 6-lane Boulevard with Class II bicycle facilities from the intersection with Taylor Road to the intersections with Fulkerth Road. The Project would be open to traffic in 2030 (Stanislaus Council of Governments 2018).
- The Stanislaus Council of Governments RTP/SCS identifies a Project to construct northbound on SR 99 and southbound auxiliary lanes between the intersection with Taylor Road to the intersections with Monte Vista Road. The Project would be open to traffic in 2030 (Stanislaus Council of Governments 2018).
- Livingston Median Widening Project would widen SR 99 from four lanes to six lanes within the median from the Stanislaus-Merced County line to Hammatt Avenue south of Livingston (California Department of Transportation 2021). The Merced County Association of Governments RTP/SCS identifies that this Project would be completed in 2024 (Merced County Association of Governments 2018).
- The Merced County Association of Governments RTP/SCS identifies widening SR 99 from 4 lanes to 6 lanes through Atwater and that the Project would be completed by 2035 (Merced County Association of Governments 2018).
- The Merced County Association of Governments RTP/SCS identifies widening SR 99 from 4 lanes to 6 lanes through Merced and that the Project would be completed by 2030 (Merced County Association of Governments 2018).
- Merced Seismic Retrofit Project would seismically retrofit the Bear Creek Bridge on SR 59 to increase their structural integrity by adding steel column casings and retrofitting hinges with pipe seat extenders and cable restrainers (California Department of Transportation 2020b)
- The City of Merced has identified widening SR 59 from two lanes to four lanes between 16th Street and Buena Vista Drive. This widening would also include replacement of the bridge over Black Rascal Creek (City of Merced 2020). The bridge replacement is located more than 0.25 mile from the Project; however, portions of the SR 59 widening are located within 0.25 mile of the Merce Layover & Maintenance Facility.

Some of these projects are fully funded; others are not yet fully funded but are expected to be funded in future years. These projects and other projects included in the transportation planning documents are not sufficient to solve the transportation problems in the corridor.

Major Non-Highway Transportation Improvements

These improvements are grouped together as project number 7 in Table 4-5 and Figure 4-1. Major planned non-highway transportation improvements within 0.25 mile of Project corridor that are listed in the transportation planning documents include the following.

- The Stanislaus Council of Governments RTP/SCS and the Merced County Association of Governments RTP/SCS identify transit centers at Turlock, Livingston, and Atwater (Stanislaus Council of Governments 2018 and Merced County Association of Governments 2018). Implementation of this Project would facilitate the completion of these Projects.
- The Merced County Association of Governments RTP/SCS identify Main Street corridor improvements in Livingston from Swan Street to Peach Avenue, which would be completed in 2022 (Stanislaus Council of Governments 2018 and Merced County Association of Governments 2018).

Some of these projects are fully funded; others are not yet fully funded but are expected to be funded in future years.

Table 4-5. Projects Considered In the Cumulative Analysis

Project Name (Reference Number)	Description	Estimated Construction Schedule	Location	Location Relative to Valley Link	Potential Conflict
Major Highway Improvements (#6)	Includes the following projects: • SR 99/Service Road/Mitchell Road Interchange Project • SR 99/Taylor Road Interchange Project • Golden State Boulevard Project • SR 99 auxiliary lanes (Turlock) • Livingston SR 99 Median Widening Project • SR 99 Widening (Atwater) • SR 99 Widening (Merced) • SR 59 Bridge over Bear Creek Retrofit • SR 59 Widening	Varies	Stanislaus and Merced Counties	Within 0.25 mile	None
Major Non-Highway Improvements (#7)	Includes the following projects: • Turlock, Livingston, Atwater Transit Centers • Main Street corridor improvements (Livingston)	Varies	Turlock, Livingston, Atwater	Within 0.25 mile	None

4.2.4.3 Land Development Adjacent to the Project Corridor

Planned, proposed, and under-construction land development projects adjacent to or within 0.15 mile of the Project corridor have the potential to overlap with the Project. Table 5-5 describes the land use projects, in various stages of development, within approximately 0.15 mile of the Project corridor.

Table 4-6. Land Development Projects Adjacent to the Project Corridor (within 0.15 mile)

Project Name (Reference Number)	Description	Estimated Construction Schedule	Location	Location relative to Project (miles)	Potential Conflict
Ceres					
Downtown Specific Plan for the City of Ceres (#8)	121 acres; the vision for the plan is that the downtown area will be a key shopping and entertainment destination, an employment center, and a government center for Ceres residents and out-of-town visitors alike	Approved, specific timing unknown	Bounded by El Camino Avenue to the west, Whitmore Avenue to the north, Ninth Street to the east, and Park Street to the south	Adjacent to Project corridor	None
Mitchell Ranch Center (#9)	Walmart supercenter with approximately 191,430 sf of commercial space	Expected to open in 2021	Northwest corner of the intersection of Mitchell Road and Service Road	0.12 mile east of Project corridor	None
Ceres Gateway (#10)	Mixed-use development (retail, industrial showroom retail, hotel, restaurants, and office space) of a 13.68-acre site	Approved, specific timing unknown	Southwest corner of the intersection of Mitchell Road and Service Road	0.03 mile east of Project corridor	None
Turlock					
Keyes Community Services District (#11)	New wastewater lift station and supporting facilities.	Early consultation, specific timing unknown	Off of Foote Road, north of E Keyes Road	0.10 mile west of Project corridor	None
Nunes Road Travel Plaza (12)	7,000 square foot convenience market; a 4,278 square foot shell building for future fast food restaurants including a drive through gas station; a 14,100 square foot truck wash and repair building; two 100-foot signs.	In planning process, specific timing unknown	Southwest corner of the intersection of Nunes Road and Golden State Boulevard.	0.14 mile east of Project corridor	None
ITC Enterprises, LLC (13)	30,000 square foot semi-truck lease, rental and service; 5,000 square foot office; 65-foot sign.	In planning process, specific timing unknown	southwest corner of Keyes Road and North Golden State Boulevard.	0.13 mile east of Project corridor	None

Project Name (Reference Number)	Description	Estimated Construction Schedule	Location	Location relative to Project (miles)	Potential Conflict
Kaiser Health (#14)	36,000 sf clinic facility to provide comprehensive health care	Approved, specific timing unknown	2981 Sun Valley Court	Adjacent to Project corridor	None
Street Level (#15)	55,000 sf retail building on approximately 4.08 acres	Approved, specific timing unknown	3701 Countryside Drive	0.07 mile west of Project corridor	None
Assyrian Pentecostal Church (#16)	12,000 sf sanctuary building, 13,000 sf multi-purpose building, and 9,854 sf multi-purpose building	Approved, specific timing unknown	3701 Mountain View Road	0.03 mile east of Project corridor	None
Florsheim Homes (#17)	107 residential units	Under construction	2531 West Tuolumne Road	0.10 mile west of Project corridor	None
API Architecture (#18)	Development of 1.26 acre site for a restaurant with a drive-through	Approved, specific timing unknown	199 W Canal Drive	0.13 mile northeast of Project corridor	None
McDonalds (#19)	Development of 4,500 sf fast food restaurant with a drive-through	Approved, specific timing unknown	699 N. Golden State Boulevard	0.8 mile northeast of Project corridor	None
Ismael Covarrubias Outdoor Dining (#20)	Development of 803 sf outdoor seating area with approximately 52 seats for use by a future restaurant	Approved, specific timing unknown	216 W Main Street	0.12 mile southwest of Project corridor	None
Legacy Nursery, LLC (#21)	Commercial cannabis nursery business	Early consultation, specific timing unknown	2201 S. Daubenberger Road	0.10 mile northeast of Project corridor	None
Atwater					
Ferrari Project (#22)	359-acre land development project, which could potentially include 191 new dwelling units, 2,494,454 sf of commercial/business park building area, 267,000 sf hospital, 399,100 sf medical offices, 20 acres reserved for regional park, and infrastructure (roads, water, sewer, and storm).	Project approval pending, specific timing unknown	Bound by Green Sands Avenue, Gurr Road, SR 99, and Augusta Lane	Adjacent to Project corridor	None

Project Name (Reference Number)	Description	Estimated Construction Schedule	Location	Location relative to Project (miles)	Potential Conflict
Merced					
Starbucks (#23)	Starbucks store	Approved, specific timing unknown	Southwest Corner of W. Main St & R St	0.12 mile northeast of Project Corridor	None

Sources: City of Ceres 2010 and 2011; Benzinger 2020; Colliers International 2021; Stanislaus County 2018a, 2018b, 2019, and 2020; City of Turlock 2020a, 2020b, and n.d.; City of Atwater 2017; Merced Sun-Star 2020.

4.2.5 Cumulative Impact Analysis

This section provides the cumulative impact analysis. The cumulative impacts analysis considers the Proposed Project and the Atwater Station Alternative in combination with the cumulative projects and cumulative projections. This cumulative impact analysis uses the term "Project" when referring to the Proposed Project and the Atwater Station Alternative. Table 4-6 summarizes the cumulative impact analysis findings.

Table 4-7. Summary of Cumulative Impacts Analysis

Impact	Overall Cumulative Impact (Project + Cumulative Projects)	Is the Project's Contribution Considerable?
Impact C-AES-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on aesthetics.	Significant	No
Impact C-AG-1: Construction and Operations of the Project could contribute considerably to a significant cumulative impact on agricultural resources.	Significant	Yes (permanent impacts on Important Farmland only)
Impact C-AQ-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on air quality.	Significant	No (beneficial)
Impact C-BIO-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on biological resources.	Significant	No
Impact C-CUL-1: Construction of the Project would not contribute considerably to a significant cumulative impact on cultural resources and tribal cultural resources. Operations of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on cultural resources and tribal cultural resources.	Construction: Significant Operation: No Impact	No
Impact C-EN-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on energy resources.	Significant	No (beneficial)
Impact C-GEO-1: Construction of the Project would not contribute considerably to a significant cumulative impact on geology, soils, and unique paleontological/geologic resources. Operations of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on geology, soils, and unique paleontological/geologic resources.	Construction: Significant (paleontological resources only) Operation: Less than significant	No
Impact C-GHG-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative GHG emissions impact.	Significant	No (beneficial)
Impact C-HAZ-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact from hazardous materials.	Significant	No
Impact C-HYD-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on hydrology and water quality.	Significant	No

Impact	Overall Cumulative Impact (Project + Cumulative Projects)	Is the Project's Contribution Considerable?
Impact C-LU-1: Construction of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on land use and planning. Operations of the Project would not contribute considerably to a significant cumulative impact on land use and planning (apart from the separately disclosed considerable contribution to agricultural land conversion under Impact CU-AG-1).	Construction: Significant Operation: No Impact	No
Impact C-NOI-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on noise and vibration.	Significant	Yes (construction) No (operations)
Impact C-POP-1: Construction of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on population and housing. Operations of the Project would not contribute considerably to a significant cumulative impact on population and housing.	Construction: Less than significant Operation: Significant	No
Impact C-PS-1: Construction and operations of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on public services.	Less than significant	--
Impact C-REC-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on recreational resources.	Significant	No
Impact C-SAF-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on safety and security.	Significant	No
Impact C-TR-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on transportation.	Significant	No
Impact C-USS-1: Construction of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on utilities and service systems. Operations of the Project would not contribute considerably to a significant cumulative impact on land use and planning.	Construction: Less than significant Operation: Significant	No

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4.2.5.1 Construction

There is the potential for cumulative construction impacts where cumulative projects and the Project overlap in location or are adjacent (i.e., affecting the same resource/receptor but potentially at different times), or if they overlap in time (i.e., affecting the same resource/receptor at the same time).

Rail Projects Planned within the Project Corridor

As described in Table 4-3, only some of the other rail projects would have construction in or adjacent to the Project corridor. Specifically, the California High-Speed Rail Project (#3) could overlap at the Merced Station (with the IOS and Phase I) and for a portion of the UPRR railroad north of Merced (with Phase II) and Freight Rail Future Plans (#5) would be located in the same area where the Project would operate. Some of these projects would be constructed prior to Project construction, some during, and some after Project construction activities would be completed.

Other Regional Transportation Improvements

As shown in Table 4-5, only some of the other regional transportation improvements would have actual construction in or adjacent to the Project corridor, including some major highway improvements (#6) and major non-highway improvements (#7). Some of these projects would be constructed prior to Project construction, some during, and some after Project construction activities would be completed.

Land Development Adjacent to the Project Corridor

None of the land development projects are located within the Project corridor. A number of these projects are adjacent to the Project corridor. Some of these cumulative projects would be constructed prior to Project construction, some during, and some after Project construction activities would be completed.

4.2.5.2 Operations

Rail Projects Planned within the Project Corridor

The rail projects planned within the Project corridor and the existing ACE corridor have various planned in-service dates. Freight service could increase incrementally over time with implementation of Freight Rail Future Plans (#5). In addition, based on their Revised 2020 Business Plan, the California High-Speed Rail Project (#3) interim operations may commence in 2029 and Phase I service may commence in 2033. Once the Project is operational (by 2025), there is potential for cumulative operational impacts to occur as other passenger and freight rail service increases over time. To analyze the potential full impact of such increases, this analysis uses the service increases shown in Table 4-4 for 2040.

Other Regional Transportation Improvements

Other transportation projects concerning highways, transit, and other roadways would not result in cumulative operational impacts along the Project corridor itself. However, there is potential for

cumulative operational impacts at areas where transportation projects intersect with the Project corridor or at new ACE stations.

Land Development Adjacent to the Project Corridor

Land development projects would not affect rail service itself but could result in cumulative operational impacts related to air quality, noise, and other operational issues in combination with the Project. In addition, land development projects adjacent to the Project corridor would result in additional residential and commercial receptors of operational train noise impacts resultant from the Project and other rail projects.

4.2.5.3 Aesthetics

The geographic context for the analysis of potential contributions to cumulative impacts on aesthetics consists of areas adjacent to, within, and in the vicinity (within 0.25 miles for transportation projects and within 0.15 miles for development projects) of the Project corridor. Cumulative projects within this geographic context include the projects listed in Tables 4-3, 4-4, and 4-6 that are within or adjacent to the Project. The cumulative analysis for Aesthetics relies on a list-based approach.

Impact C-AES-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on aesthetics.

Level of Cumulative Impact	Construction and Operations Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	AES-1.1: Install visual barriers between construction work areas and sensitive receptors AES-1.2: Limit construction near residences to daylight hours AES-1.3: Minimize fugitive light from portable sources used for construction AES-2.1: Landscape parking facilities AES-2.2: Apply aesthetic design treatments to pedestrian bridges over tracks and bridges with visibility to residents and recreationists AES-2.3: Underground new utilities AES-2.4: Apply aesthetic surface treatments to fencing and pedestrian bridge safety barriers AES-2.5: Replace disturbed vegetation along landscaped freeways AES-5.1: Apply minimum lighting standards
Project's Contribution Considerable?	Construction and Operations No

The land use changes associated with the cumulative condition resulting from implementation of the Project and the projects identified in Tables 4-3, 4-4, and 4-6 has the potential to affect aesthetic and visual resources in several ways. These impacts would result from construction activities; development of roadways, parking areas, and buildings; alteration of the study area's visual character; and the introduction of new light and/or glare sources that would change the visual conditions along the Project corridor. These changes associated with Project and other foreseeable projects would result in a significant cumulative impact on aesthetics.

Construction

As described in Section 3.1, *Aesthetics* construction of Project could substantially degrade the existing visual character or quality of the Project sites and their surroundings, including scenic vistas and scenic highways, and could create a new source of substantial light or glare that would adversely affect day or nighttime views. Visual changes resulting from introducing construction activities and equipment into the viewsheds of all user groups would be temporary. Construction activities for the Project would introduce heavy equipment and associated vehicles such as dozers, graders, scrapers, and trucks into the viewshed. Depending on location, viewers could see staging areas, worker parking, and equipment and materials storage areas, which would add industrial-looking elements into viewsheds. Construction activities involving heavy equipment use, soil and material transport, and land clearing in the right-of-way (ROW), along public roadways, and at construction staging areas would create fugitive dust. Dust clouds could hinder views, including affecting views from scenic vistas and scenic roadways. In addition, construction activities could occur near or adjacent to the homes of residential viewers, evoking a sense of invaded privacy, which would be a potentially significant project impact. However, implementation of Mitigation Measures AES-1.1, AES-1.2, AES-1.3, and SJVAPCD Regulation VIII would reduce this impact to a less-than-significant level by installing visual barriers between construction and sensitive receptors, limiting work to daylight hours adjacent to sensitive receptors, limiting construction lighting near sensitive receptors, and limiting fugitive dust. Thus, the Project's contribution to cumulative impacts on aesthetics as a result of construction would be less than considerable with mitigation.

Operations

Cumulative projects could change the visual character in the study area's visual character due to permanent structures and changes in landscaping. The analysis in Section 3.1, *Aesthetics* indicates that visual changes resulting from operation of the Project could substantially degrade the existing visual character or quality of the Project corridor and its surroundings, including scenic vistas, and would affect residential viewers, roadway travelers, and recreationists adjacent to the Project, resulting in a potentially significant project impact. In particular, Project improvements entail track improvements, new stations, and a new layover and maintenance facility that would introduce new features such as parking lots, pedestrian bridges, utility lines, railroad bridges, and vegetation removal that would alter the existing visual landscape. In addition, the new stations and layover and maintenance facility would include introduction of new lighting features or removal of trees or shrubs that would increase glare. However, implementation of Mitigation Measures AES-2.1, AES-2.2, AES-2.3, AES-2.4, AES-2.5, and AES-5.1 would reduce these impacts to a less-than-significant level by requiring landscaping for parking facilities; aesthetic design treatment for pedestrian bridges, railroad bridges, and the Merced Layover & Maintenance Facility; undergrounding of utilities where feasible; replacing disturbed vegetation along landscaped freeways; and minimum lighting standards. Thus, the Project's contribution to cumulative impacts on aesthetics as a result of operation would be less than considerable with mitigation.

4.2.5.4 Agricultural Resources

The geographic context for analysis of potential contributions to cumulative impacts on agricultural resources consists of the areas adjacent to, within, and in the vicinity of the Project corridor, specifically the San Joaquin Valley. Cumulative projects within this geographic area are listed in Tables 4-3, 4-4, and 4-6 and the existing conditions for the agricultural resources study area are

presented in Section 3.2, *Agricultural Resources.* As shown in Table 4-1, the cumulative analysis for agricultural resources relies on a list approach.

Impact C-AG-1: Construction and Operations of the Project could contribute considerably to a significant cumulative impact on agricultural resources.

Level of Cumulative Impact	Construction and Operations Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	AG-1.1: Avoid Important Farmlands and Restore Important Farmlands used for temporary staging areas AG-1.2: Conserve Important Farmlands (Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance) AG-5.1: Relocate irrigation facilities AG-5.2: Coordinate with utility providers
Project's Contribution Considerable?	Construction and Operations Yes (permanent impacts on Important Farmland only)

As described in Section 3.2, *Agricultural Resources* there is a trend toward converting existing agricultural lands to urban uses throughout the Project study area. Cumulative rail and other regional transportation projects would not likely convert agricultural lands to nonagricultural uses if these project are located entirely within the existing railroad or roadway ROW. Certain features for cumulative rail and other regional transportation projects located outside the existing railroad or roadway ROW, such as new stations and alignments, could be located in areas with existing agricultural uses and convert these resources to urban uses. Similarly, cumulative land development projects could be located in areas with existing agricultural uses. The conversion of Important Farmlands to nonagricultural uses constitutes a significant cumulative impact on agricultural resources.

Construction

Temporary Impacts on Important Farmland

The Project would require the temporary use of approximately 1.0 acres of Important Farmlands during construction. Important Farmlands that are temporarily converted to nonagricultural uses through construction would be degraded for agricultural purposes and would be vulnerable to permanent conversion to nonagricultural uses. During construction of the Project, Important Farmlands would be temporarily leased from the landowner (per a temporary construction easement) if they cannot be avoided and temporarily removed from agricultural use for the duration of construction. In addition, construction of the Project may disrupt irrigation activities and could result in utility interruptions for improvements that include Important Farmland. Irrigation and utility disruptions could also result in the conversion of Important Farmlands to nonagricultural use. Because construction disruption is likely to take place in a similar timeframe and geography to some of the cumulative projects, the Project's contribution to the cumulative impact is potentially significant. However, implementation of Mitigation Measures AG-1.1, AG-5.1, and AG-5.2 would reduce these impacts to a less-than-significant level by requiring the restoration of Important Farmlands used for temporary construction staging areas to pre-construction conditions, relocation of affected irrigation facilities, and coordination with utility providers to minimize or avoid

interruptions. Thus, the Project's contribution to cumulative impacts on agricultural resources as a result of construction would be less than considerable with mitigation.

Noise Impacts on Confined Animal Agriculture

Noise and vibration emissions resulting from construction of the rail, road, and land use development projects listed in Tables 4-3, 4-4, and 4-6 that would be located on or adjacent to Important Farmland would result in a significant cumulative impact on confined animal agriculture facilities. Noise and vibration can affect farm animal behavior and productivity. Some of the cumulative projects that, in combination with the Project, could contribute to impacts on confined animal agriculture include the following.

- California High Speed Rail (#3)
- Freight Rail Future Plans (#5)
- Major Highway Improvements (#6) such as improvements to SR 99 or widening of SR 59 in Merced
- Ferrari Project (#22)

To disturb cattle, the noise source would have to exceed the threshold of 90 decibels (Broucek 2014). As described in Section 3.2, *Agricultural Resources*, if noise levels are 90 dB or greater at the site where the animals are confined, the noise could stress the animals, resulting in changed hormone levels, reductions in milk yield, and reductions in feeding, all of which could lead to reduced productivity. Project construction would emit noise at seven confined animal facilities, but anticipated noise levels would be below 90 decibels and would not be expected to substantially alter confined animal health or behavior. The seven confined animal facilities would be located close to construction associated with the Ceres to Merced Extension Alignment, which would last a few days to a week at any one location. While construction activities at cumulative projects located near confined animal agriculture facilities may also generate noise and vibration in the area, the Project's contribution to such effects would be temporary, below identified animal distress thresholds, and would present a less than considerable contribution to such impacts.

Operations

Temporary or Permanent Disruption of Agricultural Infrastructure – Direct Impacts

As shown in Table 3.2-5 and 3.2-6, implementation of the Proposed Project would result in the direct conversion of approximately 12 acres of Important Farmland (0.9 from the Ceres to Extension Alignment and 11.1 from the Merced Layover & Maintenance Facility). Project operations will result in non-agricultural uses occurring on these lands. It is reasonably estimated that some of the projects listed in Tables 4-3, 4-4, and 4-6, would also result in some direct and/or indirect Important Farmland conversion. Therefore, the Project's direct conversion of up to approximately 12 acres of Important Farmland would constitute a cumulatively considerable contribution to this impact. With implementation of Mitigation Measure AG-1.2, the Project's operational cumulative contribution to Important Farmland conversion would be reduced; however, the Project's permanent operational contribution to cumulative impacts on Important Farmland would remain considerable with mitigation.

Temporary or Permanent Disruption of Agricultural Infrastructure – Indirect Impacts

As described in Section 3.2, *Agricultural Resources* in addition to the direct conversion of Important Farmland to nonagricultural uses, impacts on agricultural lands protected through land protection mechanisms; parcel severance; and impacts on utilities supporting agricultural uses could also result in the indirect conversion of existing agricultural lands to nonagricultural uses. The Ceres to Merced Extension Alignment would be located in Important Farmland areas would also be located on land mapped as nonprime Williamson Act land or lands under agricultural conservation easements. However, the Project would not result in any additional loss of farmland acreage beyond the acres described above due to impacts on Important Farmland. The Project would create remnant parcels; however, the remnant parcels would be adjacent to larger farmable parcels and could still be viably farmed. Operations of the Project would make no considerable contribution to conflicts with agricultural land protection mechanisms, severed parcels, and noise or vibration impacts on confined farm animal agriculture.

Noise Impacts on Confined Animal Agriculture

As shown in Table 3.2-8, there are seven confined animal holding facilities within 2,500 feet of the Project alignment. To disturb cattle, noise sources generally must exceed the threshold of 90 decibels (Broucek 2014). The anticipated noise level from operations of the Project would be below 90 decibels. Freight associated with Freight Rail Future Plans (#5) would use the same Fresno subdivision; however, it is not expected that two trains would operate in the same location near confined animal facilities at the same time. Therefore, animals would not be exposed to the combined noise emissions from two concurrently operating trains (a Project train and a freight train) in a manner that would exceed these decibel levels. Highway improvements on SR 99 and SR 59 (#6) could result in elevated operational highway noise. However, the Project would also have the effect of removing vehicles from SR 99, as more individuals use ACE as an alternative form of transportation. As such, operations of the Project would make no considerable contribution to noise or vibration impacts on confined farm animal agriculture.

4.2.5.5 Air Quality

The geographical context for the analysis of potential contributions to cumulative impacts on air quality consists of the San Francisco Bay Area Air Basin and San Joaquin Valley Air Basin (SJVAB). Because construction of the Project would occur only in the San Joaquin Valley Air Pollution Control District (SJVAPCD), which has local air quality jurisdiction in the SJVAB, the cumulative construction analysis is limited to SJVAPCD only. The operational analysis includes both the SJVAPCD and Bay Area Air Quality Management District (BAAQMD) areas. The existing conditions for the Project air quality study area are presented in Section 3.3, *Air Quality*. As shown in Table 4-1, the air quality analysis relies on the projection approach for criteria pollutants rather than on a list of individual projects, but the toxic air contaminant (TAC) analysis considers a list of projects qualitatively.

Impact C-AQ-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on air quality.

Level of Cumulative Impact	Construction and Operations Significant (see below in regard to the Project's contribution)

Mitigation Measures	AQ-2.1: Implement advanced emissions controls for off-road equipment AQ-2.2: Implement advanced emissions controls for locomotives used for construction
Project's Contribution Considerable?	Construction and Operations No (beneficial)

Construction

Criteria Pollutants

SJVAPCD has established project-level thresholds to identify projects that may contribute to violations of the ambient air quality standards (see Table 3.3-9). The mass emissions thresholds in Table 3.3-9 represent the maximum emissions a project may generate before contributing to a cumulative impact on regional air quality. During construction, both the Project and all identified cumulative projects would emit criteria pollutants from use of construction equipment and vehicles. Although construction activities would be temporary, the emissions of these pollutants and contaminants from concurrent or nearby construction of identified projects would result in a significant cumulative air quality impact.

The Project has the potential to conflict with or obstruct implementation of the applicable air quality plan because construction emissions would exceed SJVAPCD's annual nitrogen oxide (NO_X) threshold. This is a potentially significant impact as a result of the construction-period emissions, which would exceed thresholds for SJVAPCD. However, with implementation of Mitigation Measures AQ-2.1 and AQ-2.2, the Project would reduce construction-related NO_X emissions below applicable thresholds. Thus, Project's contribution to cumulative impacts on air quality during construction related to conflicts with applicable air quality plans would be less than considerable with project mitigation.

Toxic Air Contaminants

Construction of other rail improvements and other cumulative projects between Ceres and Merced (shown in Tables 4-3, 4-4, and 4-6) could emit TACs (in the form of diesel particulate matter [DPM]) from the use of construction equipment and vehicles, which could affect the health of sensitive receptors along the corridor between Ceres and Merced. This would constitute a potentially significant impact.

SJVAPCD considers risks in excess of project-level thresholds to result in a cumulatively considerable impact. Therefore, the analysis provided in Section 3.3, *Air Quality* provides the conclusions for the potential cumulative impacts. As identified in Impact AQ-3b, the Project would implement Mitigation Measures AQ-2.1 and AQ-2.2, which require the implementation of advanced control emissions for construction equipment. With implementation of this mitigation, the potential impacts from TACs would be reduced to a less than significant level. Thus, the Project's contribution to cumulative impacts on air quality related to TAC/DPM emissions for construction would be less than considerable after mitigation.

Operations

Operation of identified rail projects such as Freight Rail Future Plans (#5) as well as planned road projects such as Major Highway Improvements (#6) that would occur within the Project vicinity would result in criteria pollutants and TACs from vehicle and diesel engine use.

The identified passenger rail projects provide alternatives to vehicular travel, and freight rail provides an alternative to trucking and thus usually result in a net reduction in criteria pollutant emissions relative to vehicular travel or trucking. Other regional transportation projects would increase vehicular criteria pollutant emissions if such projects result in induced traffic. Operation of land development projects would increase criteria pollutant emissions from increased vehicular travel to and from these destinations, as well as building energy consumption, waste generation, water and waste treatment, and other sources. However, it is anticipated that some of the residents of new proposed residential development located in the Project vicinity, as well as within the vicinity of other rail projects identified in Table 4-3, would use ACE trains as a transportation alternative, thereby reducing operational criteria pollutant impacts associated with residential development below initially anticipated levels.

Criteria Pollutants

Operations of Project would reduce all criteria pollutant emissions, relative to the No Project Conditions in the BAAQMD. This would be a regional air quality benefit. In the SJVAB, Project operations would reduce emissions of CO, PM10, PM2.5, and SOx, while increasing ROG emissions and NOx emissions by amounts less than SJVAPCD thresholds.

Thus, the Project's contribution to cumulative impacts on air quality related to criteria pollutants in the BAAQMD would be less than considerable, and would in fact provide an overall benefit from reducing criteria pollutants. In the SJVAB for Project operations, the Project's contribution to cumulative impacts on air quality related to criteria pollutants would be less than considerable (beneficial) for CO, PM10, PM2.5, and SOx and less than considerable for ROG and NOx.

Toxic Air Contaminants

SJVAPCD considers risks in excess of project-level thresholds to result in a cumulatively considerable impact. Therefore, the analysis provided in Section 3.3, *Air Quality* provides the conclusions for the potential cumulative impacts.

As identified in Section 3.3, *Air Quality*, total cumulative health risks to sensitive receptors located near Project during operation would not exceed BAAQMD's and SJVAPCD's health risk thresholds. Changes in ACE service with the Project would not contribute to cumulative health hazards because predicted health risks are anticipated to be lower as a result of the ACE service changes, relative to existing conditions. If the Project is not implemented, the receptors would continue to be exposed to the existing pollution levels from ambient sources. The service extension would increase emissions from locomotives, whereas the displacement of VMT would reduce emissions from motor vehicles, beyond the effects expected with the Project. The combined effects of the changes in the ACE service, displacement of VMT, and motor vehicle and stationary source turnover represent the new emissions paradigm to which the receptors will be exposed. The combined changes in ACE service will achieve health risk reductions along the Project corridor, which also would constitute a localized air quality benefit. Accordingly, the Project's contribution to cumulative impacts on air quality related to TACs from operation of the Project would be less than considerable (beneficial).

4.2.5.6 Biological Resources

This analysis is focused on potential cumulative loss of sensitive biological resources, which includes special-status species, riparian habitats or other sensitive natural communities, protected wetlands

or waters, and wildlife migration or nursery sites. This analysis also examines potential cumulative conflicts with local biological protection ordinances or adopted habitat conservation plans (HCP).

The geographic context for the analysis of potential contributions to cumulative biological resources impacts includes the Project environmental footprint where improvements are located, as well as the immediate vicinity. For aquatic species, the geographic context also includes the streams traversed by the Project and downstream. Identified projects within this geographic context include the projects listed in Tables 4-3, 4-4, and 4-6 that are within or adjacent to the Project. The cumulative impacts analysis for Biological Resources relies on a list-based approach.

Impact C-BIO-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on biological resources.

Level of Cumulative Impact	Construction and Operations Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	BIO-1.1: Conduct preconstruction surveys for special-status plant species BIO-1.2: Prepare a salvage, relocation, or propagation and monitoring plan for special-status plant species BIO-1.3: Document affected special-status plant species BIO-1.4: Prevent introduction or spread of invasive plant species BIO-2.1: Conduct a worker environmental training program for construction personnel BIO-2.2: Avoid vernal pool–endemic species BIO-2.3: Avoid valley elderberry longhorn beetle BIO-2.4: Avoid California tiger salamander and western spadefoot toad BIO-2.5: Avoid western pond turtle and giant garter snake BIO-2.6: Avoid coast horned lizard and Northern California legless lizard BIO-2.7: Avoid nesting birds BIO-2.8: Avoid Swainson's hawk BIO-2.9: Compensate for Swainson's hawk foraging habitat loss BIO-2.10: Avoid burrowing owl BIO-2.11: Compensate for burrowing owl habitat loss BIO-2.12: Avoid song sparrow (Modesto population), tricolored blackbird, and yellow-headed blackbird BIO-2.13: Avoid roosting bats BIO-2.14: Avoid San Joaquin kit fox and American badger BIO-2.15: Compensate for San Joaquin kit fox and American badger habitat loss BIO-2.16: Avoid direct impacts on Western Monarch Butterfly Host Plants & Provide Compensatory Mitigation for Impacts on Monarch Butterfly Habitat BIO-3.1: Implement noise reduction measures for pile driving BIO-3.2: Develop and implement a hydroacoustic monitoring plan to minimize noise effects on fish BIO-3.3: Implement seasonal restrictions for in-water work BIO-4.1: Avoid and protect wetlands during construction BIO-4.2: Compensate for impacts on jurisdictional wetlands and non-wetland waters of the United States (aquatic resources) prior to improvements impacts during construction

	BIO-5.1: Avoid and protect sensitive natural communities, including riparian habitat, during construction BIO-5.2: Compensate for loss of sensitive natural communities (including riparian habitat) BIO-7.1: Compensate for tree removal during construction BIO-9.1: Avoid nesting bird impacts during operation and maintenance activities BIO-9.2: Avoid roosting bat impacts during operation and maintenance activities BIO-9.3: Conduct pre-activity survey for special-status wildlife species prior to conducting maintenance activities BIO-10.1: Model hydraulics of new bridges before construction HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters
Project's Contribution Considerable?	Construction and Operations No

Cumulative rail and other regional transportation projects would not likely affect biological resources if these projects are located entirely within the existing railroad or roadway ROW. However, certain features for cumulative rail and other regional transportation projects located outside the existing railroad or roadway ROW, such as new railroad or roadway bridges crossing waterways or new alignments, could be located in biologically sensitive areas. For example, the retrofit of the Bear Creek Bridge on SR 59 (#6) would be expected to affect the aquatic habitat of Bear Creek. Although the land uses in the vicinity of the Project corridor are generally urbanized, cumulative land development projects could be located in pockets of areas that are biologically sensitive, especially those located in areas previously not developed. The loss of biological resources, including special-status plant, wildlife, and fish species; wetlands/other aquatic resources; sensitive natural communities; and trees constitutes a significant cumulative impact on biological resources.

Construction

Construction activities for the cumulative projects could result in the loss of biological resources due to land disturbance activities, such as excavation and grading. Tree removal where sensitive biological resources are present as a result of cumulative projects would also result in the loss of biological resources. Aquatic habitat could be degraded from an increase in erosion and sedimentation during construction. Thus, construction of the Project and other cumulative projects could result in a potentially significant impact on biological resources.

The Project corridor is primarily located within an existing UPRR ROW that passes through urban and suburban areas. The majority of the Project would be located within the existing UPRR ROW, roadway ROW, or urbanized areas. Biologically sensitive areas for the Project are limited to waterways such as the Merced River, and various creeks and canals where aquatic, wetland, riparian, and woodland land covers are present.

As described in Section 3.4, *Biological Resources*, construction of the Project could have significant impacts on special-status plant, wildlife and fish species; wetlands/other aquatic resources; sensitive natural communities; and trees. However, Mitigation Measures BIO 1.1 through BIO-1.4 and HYD-1.2 for special-status plants species; BIO-2.1 through BIO-2.16 for special-status wildlife species; BIO-2.1, BIO-3.1 through BIO-3.3, BIO-4.1, BIO-4.1, BIO-5.1, BIO-5.2, and HYD-1.2 for

special-status fish species; BIO-4.1 and BIO-4.2 for wetlands and other aquatic resources; BIO-4.1, BIO-4.2, BIO-5.1, and BIO-5.2 for sensitive natural communities; BIO-2.4, BIO-2.7 through BIO-2.13, BIO-3.3, and HYD-1.2 for species movement and migratory corridors; BIO-7.1 for trees are identified to reduce construction impacts to less-than-significant levels. Generally, because construction of the Project would not occur in pristine areas, but rather in a developed rail corridors or highly urbanized areas, impacts would be to remnant biological resources within that context. With mitigation, the Project's residual construction impacts would be limited in scale and extent. Thus, the Project's contribution to cumulative impacts on biological resources as a result of construction would be less than considerable with mitigation.

Operations

Where the Project is located on existing vacant sites, in particular new stations and layover facilities, there could be increases in the stormwater runoff that may degrade water quality in surface waters downstream of the Project corridor and affect aquatic species. Similarly, cumulative projects located on vacant sites would also increase stormwater runoff, contributing to the degradation of water quality in nearby surface waters. However, compliance with existing water quality regulations and permits would require stormwater runoff treatment for all cumulative projects. Compliance with these existing regulations and permit requirements would ensure each cumulative project's contribution to stormwater runoff impacts would be less than considerable.

Increased train operations in the Project corridor could result in increased noise effects on wildlife and more train strikes on wildlife, particularly in the portions of the Project corridor where other cumulative rail projects would be located, specifically Freight Rail Future Plans (#5). Noise from cumulative rail projects and freight are expected to increase in the existing UPRR ROW where these cumulative rail projects would operate. Future operational conditions along the existing UPRR ROW are not expected to be significantly different from existing conditions with respect to special-status wildlife species. Additionally, maintenance activities associated with the Project and other cumulative projects could have significant impacts on special-status species during tree or vegetation management along the Project corridor. However, the Project would require implementation of Mitigation Measures BIO-9.1, BIO-9.2, and BIO-9.3 would require avoidance of nesting birds during vegetation management, avoidance of roosting bats during vegetation management, and pre-activity survey for special-status wildlife species.

New Project permanent structures, such as new bridges over waterways, could have significant impacts on special-status fish species due to changes to channel morphology, hydraulics, and shading where other cumulative projects would be located. Specifically, the retrofit of the Bear Creek Bridge on SR 59 (#6) could affect Bear Creek. The Project also entails a new railroad bridge over Bear Creek. However, implementation of Mitigation Measures BIO-10.1 would require modeling the hydraulics of new bridges to ensure the least impact on geomorphic integrity of waterways, and modifications to bridge designs to verify water velocities and allow migration of anadromous fish. Thus, the Project's contribution to cumulative impacts on biological resources as a result of operation would be less than considerable with mitigation.

4.2.5.7 Cultural Resources and Tribal Cultural Resources

The geographic context for the analysis of potential contributions to cumulative impacts on architectural historical resources includes the area within and adjacent to the Project corridor and the parcels surrounding and intersected by the Project. The CEQA study area for the Project includes

four historic resource under CEQA. Table 3.5-3 in Section 3.5, *Cultural Resources*, lists the four built historical resources in the CEQA study area for the Project. For archaeological resources, tribal cultural resources, and human remains, the geographic context for potential cumulative impacts includes areas where cumulative projects overlap with the Project improvements to affect a single resource. Table 3.5-2 lists the two archaeological resources in the CEQA study area for the Project. Cumulative projects in the geographic area for cultural resources include all projects listed in Tables 4-3, 4-4, and 4-6 that are within or adjacent to the areas planned for Project improvements. The cumulative analysis for cultural resources relies on a list approach.

Project impacts are limited to permanent impacts from the construction of the Project. The Project would have no impact on cultural resources during operations as the Project would not require further ground disturbance during operations. Because the Project would have no impact on cultural resources during operations, it cannot contribute to any potential cumulative impacts on cultural resources. The topic of impacts on cultural resources from operations, therefore, not discussed further in this chapter.

Impact C-CUL-1: Construction of the Project would not contribute considerably to a significant cumulative impact on cultural resources and tribal cultural resources. Operations of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on cultural resources and tribal cultural resources.

Level of Cumulative Impact	Construction Significant (see below in regard to the Project's contribution) Operations Less than significant
Mitigation Measures	CUL-1.1: Prepare and submit Historic American Engineering Record documentation CUL-1.2: Prepare interpretive exhibits CUL-2.1: Develop and implement an Archaeological Testing Plan CUL-2.2: Conduct cultural resources awareness training CUL-2.3: Implement cultural resources monitoring plan CUL-2.4: Implement avoidance and protection measures CUL-2.5: Conduct archaeological monitoring CUL-2.6: Implement procedures in case of inadvertent discoveries CUL-3.1: Comply with state laws relating to Native American remains CUL-4.1: Implement procedures in case of inadvertent tribal cultural resources discoveries
Project's Contribution Considerable?	Construction and Operations No

Construction of cumulative rail and other transportation projects could result in a significant cumulative impact on historic resources. An adverse change to an eligible and listed property in the National Register of Historic Places and California Register of Historical Resources during the construction of a cumulative project could result in significant cumulative impacts on historic resources.

Additionally, construction activities associated with these cumulative projects could affect archaeological resources, tribal cultural resources, or human remains in or adjacent to the Project

corridor. If known or unknown archaeological resources, tribal cultural resources, or human remains are disturbed, the cumulative projects could result in significant cumulative impacts.

Construction of other cumulative projects, including land development projects, could also affect cultural resources outside the Project corridor and its immediate vicinity. Because these impacts would be site specific and would not overlap geographically with the Project, they would not interact with the Project and are not discussed further in this analysis.

Construction

Historic Resources

As described in Section 3.5, *Cultural Resources,* the Project would not result in changes to the significance of a historic resource to the point where the resource would no longer be considered historic. Thus, the Project's contribution to cumulative impacts on historic resources as a result of construction would be less than considerable.

Archaeological Resources, Human Remains, and Tribal Cultural Resources

Because impacts on archaeological resources and tribal cultural resources are site specific, the Project's contribution to cumulative impacts on archaeological resources and tribal cultural resources would depend on the geographic overlap of the Project excavation areas with cumulative project excavation areas. The majority of Project improvements would be within or directly adjacent to the existing UPRR ROW, in disturbed areas that have undergone multiple previous periods of excavation and construction. However, previous disturbance does not preclude the potential to affect cultural deposits, and encountering significant cultural resources during construction of the Project would result in a significant impact on a unique archaeological resource. Implementation of Mitigation Measures CUL-2.1 through CUL-2.6 and CUL-4.1, would require pre-construction cultural resources awareness training, preparation of a cultural resources monitoring plan, archaeological monitoring, establishing procedures in case of inadvertent discoveries, archaeological testing, application of avoidance and protection measures in the event of newly discovered sites, and implementation of procedures in case of inadvertent tribal cultural resources discoveries. Thus, the Project's contribution to cumulative impacts on archaeological resources and tribal cultural resources as a result of construction would be less than considerable with mitigation.

As described in Section 3.5, construction of the Project could disturb human remains, including those interred outside of formal cemeteries. Although the Project would primarily be located within or directly adjacent to the existing UPRR ROW where there have been multiple previous periods of excavation and construction, previous disturbance does not preclude the potential to affect cultural deposits, including human remains. Thus, the potential to uncover human remains, including Native American human remains exists and although not anticipated, human remains could be identified during site-preparation and grading activities. Implementation of Mitigation Measure CUL-3.1 requires compliance with state laws relating to Native American remains, and would reduce the Project's potential impacts on human remains to a less-than-significant level. In addition, other cumulative Project's would be subject to the same state law. Thus, the Project's contribution to cumulative impacts on human remains as a result of construction would be less than considerable with mitigation.

4.2.5.8 Energy Resources

The geographic context for potential contributions to cumulative impacts on energy resources is the service areas of the energy providers to the Project corridor. Cumulative projects within this geographic context include all projects listed in Tables 4-3, 4-4, and 4-6. The cumulative analysis for energy resources relies on a list approach.

Impact C-EN-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on energy resources.

Level of Cumulative Impact	Construction and Operations Significant
Mitigation Measures	AQ-2.1: Implement advanced emissions controls for off-road equipment AQ-2.2: Implement advanced emissions controls for locomotives used for construction
Project's Contribution Considerable?	Construction and Operations No (beneficial)

Construction

During the construction of the Project and the cumulative projects listed in Tables 4-3, 4-4, and 4-6, there could be a temporary distributed increased demand for energy resources across Stanislaus and Merced Counties. However, these regions already accommodate substantial construction projects, and the overall level of construction, considered on a regional scale, is not expected to substantially change with the cumulative projects compared with existing conditions. Therefore, the overall change in demand in energy resources is not expected to affect local or regional energy supplies and require additional capacity during peak and base period demands for electricity to meet that increased demand.

Furthermore, as described in Section 2.0, *Project Description*, the new track would be constructed linearly, with construction activities lasting a few days to approximately a week before moving to a different location. The primary sites of sustained construction activities and subsequent energy use required for Project construction would be at facilities such as stations and the Merced Layover & Maintenance Facility. Identified projects that would be located near (within approximately 0.5 miles of) such facilities include the following.

- Improvements to SR 99 (#6)
- Improvements to Golden State Boulevard (#6)
- Widening of SR 59 (#6)
- Improvements to Main Street in Livingston (#7)
- API Architecture (#18)
- McDonalds (#19)
- Starbucks (#23)

Construction of these projects, in addition to Project construction, is expected to locally increase energy resource demands to meet construction energy needs. This collective use of energy could be a significant cumulative impact. However, as described in Section 3.3, *Air Quality*, Mitigation

Measures AQ-2.1 and AQ-2.2 would require the implementation of advanced emissions controls thaw would minimize emissions and uses fuel efficiently. Additionally, many financial incentives are offered by government agencies and utility companies to support energy-efficient investments. Therefore, it is expected that construction materials built and purchased from offsite suppliers would be efficiently produced based on the economic incentives for efficiency. In addition, jurisdictions in which construction would occur require reuse and recycling of construction and demolition materials, which would reduce the inherent energy cost of materials. Government agencies and utility companies offering incentives for energy-saving construction practices for the Project would also likely serve the identified projects located within the same region, and energy-saving regulatory requirements would be the same for multiple construction projects occurring within the same jurisdiction. Thus, with adherence to these incentives and policies, as well as adherence to the mitigation measures described above, the Project's contribution to cumulative construction-phase energy impacts would be less than considerable with mitigation.

Operations

Operations of the Project trains, as well as the other passenger rail projects identified in Tables 4-3, including the ACE Extension Lathrop to Ceres (#1), Valley Rail Sacramento Extension Project (#2), California High-Speed Rail (#3), Valley Link (#4), and Freight Rail Future Plans (#5) would all require fuel energy to operate. Other identified projects, such as residential and commercial development, would also require energy to operate. Collectively, these would result in a significant cumulative energy impact. However, passenger rail projects are expected to result in overall reduced energy use from a reduction in automobile vehicle miles traveled (VMT) and, subsequently, overall savings in automobile fuel consumption from the modal shift from personal vehicle use to mass rail transit. Therefore, the Project's contribution to any cumulatively significant operational energy impact would not be considerable; in fact, the Project would result in energy savings that would be an environmental benefit.

4.2.5.9 Geology and Soils

Impacts related to geology, soils, and paleontological resources are typically site-specific and depend on the local geologic and soil conditions. The geographic context for the analysis of potential cumulative impacts on geology, soils, and paleontological resources includes areas within and adjacent to the Project. Impacts related to paleontological resources are specific to the geologic units in which activities would occur and depend on the previous disturbance of sediments. The study area for paleontological resources includes the geologic units affected by the Project as listed in Table 3.7-1.

Cumulative projects within this geographic context include the projects listed in Tables 4-3, 4-4, and 4-6, which displays all projects that are located within or adjacent to the Project. The cumulative analysis for geology, soils, and paleontological resources relies on a list-based approach.

Impact C-GEO-1: Construction of the Project would not contribute considerably to a significant cumulative impact on geology, soils, and unique paleontological/geologic resources. Operations of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on geology, soils, and unique paleontological/geologic resources.

Level of Cumulative Impact	Construction Significant (paleontology only; see below in regard to the Project's contribution) Less than significant (geology and soils) Operations Less than significant
Applicable Mitigation Measure	GEO-3.1: Monitor for discovery of paleontological resources, evaluate found resources, and prepare and follow a recovery plan for found resources
Project's Contribution Considerable?	Construction No

Construction

Construction impacts are limited to the potential for increased erosion and potential damage to paleontological resources. Impacts related to other geologic and soil conditions are discussed under operations. However, paleontological resources are nonrenewable and are subject to impacts from ground-disturbing activities such as grading, excavation, and vegetation clearing (Society for Vertebrate Paleontology 2010). As a nonrenewable resource, rail, road, and land development activities on geologic units that may contain paleontological resources have the potential to remove such resources irretrievably from the scientific record. Accordingly, in areas of rapid growth where paleontological resource-rich geologic units lie close to the ground surface, such as in the paleontological resources study area described in Section 3.7, *Geology and Soils*, a cumulative impact on paleontological resources has potential to exist.

Geologic and Soil Conditions

Construction of any of cumulative projects listed in Tables 4-3, 4-4, and 4-5 could result in cumulatively significant erosion impacts unless construction activities are controlled. All new projects that disturb one or more acres, which includes all of the cumulative projects listed in Tables 4-3, 4-4, and 4-5 as well as the Project, must comply with the NPDES Construction General Permit, which requires substantive controls to prevent erosion during project construction, including preparation of a Stormwater Pollution Prevention Plan (SWPPP). As a result, no significant cumulative erosion impact would occur.

Paleontological Resources

Construction of any of the cumulative rail, road, and land use development projects listed in Tables 4-3, 4-4, and 4-6 that are located on geologic units with high or undetermined paleontological sensitivity have potential to result in cumulative impacts to paleontological resources as a result of ground-disturbing construction activities. As shown in Figure 3.7-15 and described in Table 3.7-1, the Modesto Formation and the Riverbank Formation are considered sensitive for paleontological resources. Although some of the cumulative projects identified in Table 4-3, 4-4, and 4-6 would be located in previously disturbed areas, most would be located within the Modesto Formation.

Because the geographical areas described above are subject to population growth, and the sediments at 5 feet and greater below ground surface have largely not been disturbed, construction of these cumulative projects, as well as the Project, could have a significant cumulative impact on paleontological resources.

The Project would be located in areas that are underlain by geologic units that have yielded abundant, diverse, and scientifically important fossil finds, including remains of numerous vertebrates. Where geologic units with high paleontological sensitivity are present, construction-related ground disturbance, particularly excavation and grading, could result in disturbance, damage, or loss affecting significant (scientifically important but non-unique) paleontological resources. Ground disturbance by cumulative projects located within these sensitive geologic units presents a similar potential to disturb, damage, or lose such resources. However, implementation of Mitigation Measure GEO-3.1 during Project construction would require paleontological monitoring, resource evaluation, and the preparation of recovery plans for found resources. Incorporation of this measure would provide ample protection for paleontological resources during Project construction. Thus, by recovering any paleontological resources found during ground-disturbing activities and conserving information about the context in which they were found, the Project's contribution to cumulative impacts on paleontological resources or unique geologic features as a result of construction would be less than considerable.

Operation

Geologic and Soil Conditions

Individual cumulative projects could increase exposure of people or structures to geologic, seismic and soil hazards that could result in a project-level impact. The western portions of the Central Valley are likely to experience strong seismic activity that could damage structures or expose people to greater risks of loss of life and injury. However, all individual projects would be subject to applicable state codes, particularly the California Building Standards Code and the requirements of the Alquist-Priolo Act, along with local codes and design standards, all of which are specifically designed to reduce site-specific geologic, seismic, and soils hazards. Septic systems, if necessary, for any identified projects, are regulated by the County's respective Local Agency Management Programs for Onsite Wastewater Treatment Systems, which are in turn regulated by the State Water Resources Control Board (SWRCB). Local Agency Management Programs contain specific septic system design and operational requirements that are intended to reduce the potential for water quality degradation to the maximum extent practicable.

As described in Section 3.7, *Geology and Soils,* portions of the Project would be sited in areas with known geologic hazards, including corrosive soils and strong groundshaking. However, the Project would be designed and constructed in accordance with industry design standards, guidelines, and regulations, which would ensure that geologic and soil hazards do not compromise the structural integrity of the facilities that are proposed. Therefore, there would be no cumulative geologic and soil hazard impacts.

Paleontological Resources

Operations and maintenance activities associated cumulative with rail, road, and development projects that would be located on geologic units with high or undetermined paleontological sensitivity (Modesto Formation) could potentially affect paleontological resources if ground-disturbing maintenance activities are required. While operational activities are generally not ground

disturbing, maintenance activities can involve ground disturbance such as vegetation removal, which could result in erosion that may expose or damage paleontological resources. However, because ground disturbance associated with maintenance generally takes place on land previously disturbed during project construction, no significant cumulative operational impact on paleontological resources is expected to occur.

4.2.5.10 Greenhouse Gas Emissions

The geographic context for cumulative impacts on GHG emissions is the planet. All of the projects in Tables 4-3, 4-4, and 4-6 are included in the analysis as well as cumulative GHG emissions from California, the United States, and the rest of the world. As shown in Table 4-1, the cumulative analysis for GHGs relies on a projection approach for GHG emissions.

Impact C-GHG-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative GHG emissions impact.

Level of Cumulative Impact	Construction and Operations Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	None
Project's Contribution Considerable?	Construction and Operations No (beneficial)

During construction, all cumulative projects would emit GHGs from construction equipment and vehicles. Although construction activities are temporary, the lifespan of the most emitted GHG, carbon dioxide, can be up to 100 years, and many of the other GHGs can last for decades. Operation of the cumulative rail projects identified in Table 4-3 would result in GHG emissions. However, these cumulative rail projects provide alternatives to vehicular travel, and freight rail provides an alternative to trucking and thus usually result in a net reduction in GHG emissions relative to vehicular travel or trucking. Other regional transportation projects would increase vehicular GHG emissions if such projects result in induced traffic. Operation of cumulative land development projects would increase GHG pollutant emissions from increased vehicular travel, as well as building energy consumption, waste generation, water and waste treatment and other sources. The emission of GHGs constitutes a significant cumulative impact.

Construction

As described in Section 3.8, *Greenhouse Gas Emissions*, construction of the Project could create GHG impacts through the use of heavy-duty construction equipment, construction worker vehicle trips, truck hauling trips, and locomotive trips. Although there is no threshold for construction-period emissions, Mitigation Measures AQ-2.1 and AQ-2.2, which are required to reduce criteria pollutant emissions, would also reduce GHG emissions during construction. The Project's contribution to cumulative GHG emissions during construction would be less than considerable because operational GHG emissions reductions would more than offset construction emissions in a few years' time.

Operations

Over time, local, state, and federal plans are seeking to dramatically reduce GHG emissions overall. Many of the communities along the Project corridor have adopted local climate action plans to

reduce GHG emissions in their jurisdictions, and Assembly Bill 32 mandated GHG emission reductions at a state level. According to the state's latest inventory data in 2017, the state's emission had been reduced to slightly below 1990 levels.

As described in Section 3.8, *Greenhouse Gas Emissions*, operations of the Project would increase existing operational GHG benefits, resulting in even greater GHG reductions, relative to the No Project Conditions (see Impact GHG-1). Operational GHG reduction benefits from the Project would offset the short-term construction increase in GHG emissions in two and a half years based on expected 2025 reductions.[3] Emissions savings achieved thereafter would contribute to reductions in GHG emissions and more than offset the GHG emissions of the Project during the construction period. This reduction would be an environmental benefit and as a result, the Project's contribution to cumulative GHG emissions during operations would be less than considerable (beneficial).

4.2.5.11 Hazardous Materials

Hazardous materials impacts are typically site specific and depend on the soil and groundwater conditions underlying project sites. The geographic context for potential cumulative impacts related to hazardous materials includes areas within 0.25 miles of the Project for transportation projects and 0.15 miles for development projects, respectively. Projects within this geographic context include the projects listed in Tables 4-3, 4-4, and 4-6. The analysis for hazardous materials relies on a list-based approach.

Impact C-HAZ-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact from hazardous materials.

Level of Cumulative Impact	Construction and Operations Significant (see below in regard to the Project's contribution)
Mitigation Measures	HAZ-2.1: Conduct site investigations HAZ-2.2: Implement construction risk management plan AQ-2.5: Implement fugitive dust controls during construction
Project's Contribution Considerable?	Construction and Operations No

Construction

Any of the projects listed in Tables 4-3, 4-4, and 4-6 could expose people or the environment to hazardous materials present in the underlying soils or groundwater. These projects could also expose people or the environment to such materials by using hazardous materials typically associated with construction.

In addition, some of the projects listed in Tables 4-3, 4-4, and 4-6 would likely take place within 0.25 mile of a K–12 school, and therefore present the potential to expose students to such materials if appropriate remediation strategies are not incorporated. For projects involving improvements to or development of a site where soil or groundwater contamination has already occurred, the potential exists for a release of hazardous materials during construction and/or remediation of

[3] Train service between Ceres and Merced is expected to commence with one round trip per day in 2025 and increase to four trains by 2030. While not quantified, the GHG reductions in 2025 are likely to be approximately one quarter of those estimated for 2030 (based on the difference in train service). Presuming the 2025 GHG reductions are 25 percent of those in 2030, it would take approximately 2.5 years to offset the construction GHG emissions.

those sites. Some of the identified projects are proposed in areas with known contamination, and other projects may encounter previously unknown contamination issues. Exposure to hazardous materials also includes potential exposure to toxic air contaminants, which consist primarily of diesel particulate matter and fugitive dust, as described in greater detail in Section 3.3, *Air Quality*. Construction equipment that would be used to construct the Project and the projects listed in Tables 4-3, 4-4, and 4-6 can emit diesel particulate matter, and earthmoving construction activities such as grading and excavation present the potential to generate fugitive dust. The exposure of people or the environment to hazardous materials during construction of identified projects could constitute a significant cumulative impact.

As described in Section 3.9, *Hazardous Materials*, contaminated soil and groundwater may be encountered during construction of the Project. In addition, construction activities would involve use of common hazardous materials such as fuels, paints, and lubricants. Compliance with local, state, and federal regulations for handling hazardous materials and adherence to the mandatory stormwater pollution prevention plan (SWPPP) would address impacts associated with construction handling of hazardous materials. For encountered contamination, implementation of Mitigation Measures HAZ-2.1, HAZ-2.2, HAZ-2.3, and SJVAPCD Regulation VIII would require establishing a voluntary oversight agreement, pre-construction investigations of potentially contaminated areas, preparation of a risk management plan (RMP) outlining appropriate containment procedures for handling and disposal of any encountered contaminated soil and groundwater, and fugitive dust controls. Other cumulative projects would be required to comply with these existing regulations. Thus, with adherence to these regulations and incorporation of mitigation measures, the Project's contribution to cumulative impacts related to hazardous materials because of construction would be less than considerable with mitigation.

Operation

Operationally, the land development projects listed in Table 4-6 that involve residential, commercial, and office uses would generally have limited types and quantities of hazardous materials present, and these materials would typically be limited to household-type products such as cleaners. Because these materials would generally be present in small quantities and would be contained, they are not considered to result in a significant cumulative impact.

Rail and other regional transportation projects as displayed in Tables 4-3 and 4-4, as well as land development projects involving medical and industrial and some commercial uses (references 11, 12, 13, 14, 19, 21, 22) would most likely involve greater amounts of operational hazardous materials. Hazardous materials present at these facilities may include solvents, flammable materials, compressed gases, fuels, maintenance materials, and industrial cleaning fluids along with other chemicals used in materials processing, medical facility, and transportation operations. Some of these projects would also generate hazardous materials waste. Use and handling of such materials is highly regulated by local, state, and federal requirements. However, the exposure of people or the environment to hazardous materials during operation of the identified projects could constitute a significant cumulative impact.

Operation and maintenance activities associated with the Project would involve the routine use of renewable diesel to power locomotives and pesticides to clear vegetation from track areas. Similar to current ACE operations, common activities such as fueling and pesticide applications could result in the exposure of workers, the public, and/or the environment to hazardous materials if the materials are not properly managed or are accidentally released. Adherence to federal and state

regulations and the California Environmental Protection Unified Program reduces the risk of exposure to hazardous materials, as well as the risk of accidental release of hazardous materials. However, maintenance of the Project could result in the disturbance of contaminated soil, ballast, and/or groundwater. For encountered contamination during maintenance activities, implementation of Mitigation Measures HAZ-2.1, HAZ-2.2, HAZ-2.3, and SJVAPCD Regulation VIII require establishing a voluntary oversight agreement, pre-construction investigations of potentially contaminated areas, preparation of a RMP outlining appropriate containment procedures for handling and disposal of any encountered contaminated soil and groundwater, and fugitive dust controls. Thus, the Project's contribution to cumulative impacts related to hazardous materials as a result of operations would be less than considerable, assuming mitigation and adherence to all applicable regulatory requirements.

4.2.5.12 Hydrology and Water Quality

The geographic context for cumulative impacts on hydrology and water quality consists of the Project footprint, vicinity, and downstream waterbodies. Cumulative projects within this geographic context include the projects listed in Tables 4-3, 4-4, and 4-6. The cumulative analysis for hydrology and water quality relies on a list approach and considers potential cumulative impacts associated with erosion, stormwater runoff, water quality, groundwater recharge, changes to drainage patterns, and flooding, in the context of the Project and the projects listed in Tables 4-3, 4-4, and 4-6.

Impact C-HYD-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on hydrology and water quality.

Level of Cumulative Impact	Construction and Operations Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	HYD-5.1: Prevent construction materials and equipment from impeding or redirecting flood flows HYD-6.1: Perform detailed hydraulic evaluations and modify designs for improvements within drainage courses and flood zones if required to reduce potential flooding impacts HYD-8.1: Perform detailed hydraulic evaluations and modify designs for stormwater controls if required to prevent storm drainage system capacity exceedance and/or reduce potential flooding impacts HAZ-2.3: Implement construction risk management plan
Project's Contribution Considerable?	Construction and Operations No

Construction

Water Quality – Erosion and Spills

Earthmoving activities associated with the projects listed in Tables 4-3, 4-4, and 4-6 have the potential to increase erosion and result in accidental spills of hazardous materials. During winter storm events, disturbed soils and hazardous materials could be transported to downstream receiving water bodies, resulting in sedimentation and accumulation of pollutants such as fuels, lubricants, and paints that could degrade water quality. Therefore, projects that would also occur adjacent to water bodies, including creeks and canals spanned by the Project would result in significant cumulative erosion- and pollutant-related water quality impacts during construction.

As described in Section 3.10, *Hydrology and Water Quality*, the Project also has the potential to degrade water quality from soil, sediment, construction materials, and hazardous materials that could be transported to downstream waterbodies. Furthermore, the Project would also involve direct, in-water work for bridges and culverts in a variety of locations. However, projects that disturb 1 acre or more of soil, which includes the Project as well as most of the projects listed in Tables 4-3, 4-4, and 4-6, are required to comply with the requirements of the SWRCB's NPDES Construction General Permit, which requires preparation of a SWPPP and implementation of best management practices that are specifically designed to protect water quality. Additionally, the Project would require implementation of permit requirements from California Department of Fish and Wildlife, U.S. Army Corps of Engineers (USACE), and/or the SWRCB. Additional requirements that would also prevent degradation of water quality for in-water work include the Clean Water Act Section 401 Water Quality Certification. Similarly, the one cumulative project that has been identified to potentially require in-water work (retrofit the Bear Creek Bridge on SR 59 [#6]) would be required to adhere to these same regulations. In summary, both the Project and the cumulative projects would be required to adhere to local, state, and federal regulations that require the implementation of measures to protect water quality. Thus, the Project's contribution to cumulative construction impacts on water quality from erosion would not be considerable.

Water Quality – Flooding

The Project would be located within mapped 100-year floodplains. The HSR Project (#3), retrofit of the Bear Creek Bridge on SR 59 (#6), Widening of SR 59 (#6), and the Starbucks Project (#23) would also be located within the 100-year floodplain. If storm-related flooding of construction areas were to occur, stockpiles of construction materials could be inundated and carried into onsite or offsite waterbodies, which could result in pollution of surface waters. Therefore, these projects would result in significant cumulative flood-related water quality impacts during construction. As described in Section 3.10, *Hydrology and Water Quality*, implementation of Mitigation Measure HYD-5.1 would prevent construction materials and equipment from impeding or redirecting flood flows, thereby protecting water quality. Thus, the Project's contribution to cumulative construction impacts on water quality from flooding would be less than considerable with mitigation.

Operations

Water Quality and Stormwater Runoff

Operation of any of the projects listed in Tables 4-3, 4-4, and 4-6 could degrade water quality due to an increase in impervious surfaces (which would increase the amount of stormwater runoff) and handling of hazardous materials (which could contaminate the stormwater runoff). Increases in stormwater runoff could cause downstream erosion and sedimentation, resulting in increased turbidity in receiving waters, depending on waterway conditions. Contaminated stormwater runoff would result in increased pollutant loading due to contact with petroleum and other contaminants commonly deposited on impervious surfaces. In addition, rail and other regional transportation projects would increase the potential for leakage of diesel, oil, and grease, and for accidental spills of herbicides, which are used for vegetation maintenance along railway corridors; leaks or spills of any of these materials could further degrade surface water quality. Therefore, the cumulative operational water quality impacts of these projects could be significant.

As described in Section 3.10, operation of the Project could result in increased pollutants involving petroleum products (e.g., oil, grease, and diesel) and metals. Under typical operating conditions, the

amount of these pollutants released by modern trains is minimal (i.e., only minor drips) because trains undergo regular inspections and maintenance to prevent and fix leaks. The Project would also increase impervious surface areas, which would accommodate vehicle parking, train maintenance, and fueling activities. These uses would contribute pollutants to stormwater runoff; however, compliance with existing regulations (e.g., the Construction General Permit; requirements for Priority Development Projects under the Central Valley Permit or Small Municipal Separate Storm Sewer System [MS4] Permit; and Industrial General Permit) and design of stormwater control systems in the UPRR ROW in accordance with the California Department of Transportation Project Planning and Design Guide (California Department of Transportation 2019) would ensure that stormwater runoff from the Project would not cause erosion and sedimentation in receiving waters and that runoff from impervious surface areas is managed and treated to remove contaminants. Most, if not all cumulative projects would also be required to comply with applicable NPDES/MS4 permits during operation. Additionally, implementation of Mitigation Measure HAZ-2.3 would require preparation of an RMP, which would include guidelines for testing and reuse of existing soil to ensure that potentially contaminated existing soil would not be reused in a manner that could pollute stormwater runoff, surface waters, or groundwater. Thus, the Project's contribution to cumulative operational impacts on water quality and stormwater runoff would be less than considerable with mitigation.

Groundwater Recharge

The Project, as well as all of the projects listed in Tables 4-3, 4-4, and 4-6 would involve the creation of new impervious surfaces that could impede groundwater recharge because stormwater would run off of the impervious surfaces rather than infiltrating the ground surface and recharging aquifers. Stormwater runoff would be conveyed either to local surface drainage ways, where it would percolate through the ground back into the groundwater aquifer or would be conveyed via underground pipelines to larger streams and rivers. Improvements within the existing UPRR ROW (e.g., new platforms) at new stations would be required to comply with the post-construction requirements of the NPDES Construction General Permit, which requires post-construction runoff to match pre-construction runoff for the 85th-percentile storm event. New station features outside the UPRR ROW (e.g., parking lots, roadways, and walkways) would be required to comply with applicable MS4 Permit requirements for stormwater control and treatment, which include low-impact development source control, site design, stormwater treatment, and hydromodification management. Thus, the Project's contribution to cumulative impacts on groundwater recharge during operations would be less than considerable.

Changes in Drainage Patterns and Flooding

The Project, as well as all of the projects listed in Tables 4-3, 4-4, and 4-6 would involve the creation of new impervious surfaces that could result in changes to existing drainage patterns that may create or contribute excessive runoff that would exceed the capacity of stormwater drainage systems and result in localized flooding. Local planning requirements would require most, if not all, cumulative projects to prepare an analysis of a project's individual impacts on the existing drainage systems. If a project's impacts are significant, fair-share contributions toward facility improvements over time are generally required. In addition, compliance with regional and countywide stormwater regulations would address substantial sources of increased runoff associated with cumulative projects and require such projects to provide features for retention of water onsite and treatment of stormwater runoff. Project improvements within the existing UPRR ROW would include altering drainage patterns by altering or creating trackside ditches and drainage systems. Project

improvements outside the UPRR ROW would also include new impervious surfaces and stormwater drainage systems at new stations and facilities, which would alter drainage patterns and create new sources of runoff. If stormwater control systems are not appropriately designed for these improvements, stormwater runoff could exceed the capacity of stormwater drainage systems and result in flooding. However, compliance with existing regulations, including post-construction requirements of the Construction General Permit and hydromodification management requirements of applicable MS4 permits, would minimize stormwater runoff. Additionally, Mitigation Measure HYD-8.1 would require detailed hydraulic evaluations to ensure that new stormwater control infrastructure would be appropriately designed and that runoff from Project would not exceed the capacity of storm drainage systems and result in localized flooding.

As described in Section 3.10, portions of the Project would be located within drainage courses and/or flood zones (including mapped 100-year flood zones) that could potentially impede or redirect flood flows during operation if the improvements are not appropriately designed. Four other cumulative projects have been identified to be located within a 100-year flood zone [HSR Project (#3), retrofit of the Bear Creek Bridge on SR 59 (#6), Widening of SR 59 (#6) and the Starbucks Project (#23)]. The cumulative projects are also subject to post-construction requirements of the SWRCB's NPDES Construction General Permit and hydromodification management requirements of applicable MS4 permits, which are designed to reduce runoff and thereby limit the potential for flooding created by stormwater runoff. Nonetheless, a significant cumulative impact could occur if these cumulative projects resulted in a cumulative change in impervious surfaces that would result in substantial flooding. The Project would require implementation of Mitigation Measure HYD-6.1, which requires the implementation of design features for facilities located within mapped 100-year flood zones to reduce the potential flooding impacts to be equivalent to the existing conditions. Thus, the Project's contribution to cumulative impacts related to changes in drainage patterns and flooding during operations would be less than considerable with mitigation.

4.2.5.13 Land Use and Planning

The geographic context for potential cumulative impacts on land use consists of the areas adjacent to and in the vicinity of the Project. Cumulative projects within this geographic context include the projects listed in Tables 4-3, 4-4, and 4-5. The cumulative analysis for land use and planning relies on a list approach.

As described in Section 3.11, *Land Use and Planning*, activities within the UPRR ROW are exempt from local building and zoning codes and other land use ordinances. Thus, the portions of the Project within the existing UPRR ROW are not subject to local or regional plans or regulations, and no land use impacts are expected within the existing UPRR ROW. Consequently, the cumulative land use and planning analysis focuses on locations where the Project would occur outside the existing UPRR ROW (i.e., the stations and the Merced Layover & Maintenance Facility).

Impact C-LU-1: Construction of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on land use and planning. Operations of the Project would not contribute considerably to a significant cumulative impact on land use and planning (apart from the separately disclosed considerable contribution to agricultural land conversion under Impact C-AG-1)

Level of Cumulative Impact	Construction Less than significant Operations Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	BIO-1.1: Conduct preconstruction surveys for special-status plant species BIO-1.2: Prepare a salvage, relocation, or propagation and monitoring plan for special-status plant species BIO-1.3: Document affected special-status plant species BIO-1.4: Prevent introduction or spread of invasive plant species BIO-2.1: Conduct a worker environmental training program for construction personnel BIO-2.2: Avoid vernal pool–endemic species BIO-2.3: Avoid valley elderberry longhorn beetle BIO-2.4: Avoid California tiger salamander and western spadefoot toad BIO-2.5: Avoid western pond turtle and giant garter snake BIO-2.6: Avoid coast horned lizard and Northern California legless lizard BIO-2.7: Avoid nesting birds BIO-2.8: Avoid Swainson's hawk BIO-2.9: Compensate for Swainson's hawk foraging habitat loss BIO-2.10: Avoid burrowing owl BIO-2.11: Compensate for burrowing owl habitat loss BIO-2.12: Avoid song sparrow (Modesto population), tricolored blackbird, and yellow-headed blackbird BIO-2.13: Avoid roosting bats BIO-2.14: Avoid San Joaquin kit fox and American badger BIO-2.15: Compensate for San Joaquin kit fox and American badger habitat loss BIO-2.16: Avoid direct impacts on Western Monarch Butterfly Host Plants & Provide Compensatory Mitigation for Impacts on Monarch Butterfly Habitat BIO-3.1: Implement noise reduction measures for pile driving BIO-3.2: Develop and implement a hydroacoustic monitoring plan to minimize noise effects on fish BIO-3.3: Implement seasonal restrictions for in-water work BIO-4.1: Avoid and protect wetlands during construction BIO-4.2: Compensate for impacts on jurisdictional wetlands and non-wetland waters of the United States (aquatic resources) prior to improvements impacts during construction BIO-5.1: Avoid and protect sensitive natural communities, including riparian habitat, during construction BIO-5.2: Compensate for loss of sensitive natural communities (including riparian habitat) BIO-7.1: Compensate for tree removal during construction

	BIO-9.1: Avoid nesting bird impacts during operation and maintenance activities BIO-9.2: Avoid roosting bat impacts during operation and maintenance activities BIO-9.3: Conduct pre-activity survey for special-status wildlife species prior to conducting maintenance activities BIO-10.1: Model hydraulics of new bridges before construction HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters AG-1.1: Avoid Important Farmlands and Restore Important Farmlands used for temporary staging areas AG-1.2: Conserve Important Farmlands (Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance) AG-5.1: Relocate irrigation facilities AG-5.2: Coordinate with utility providers
Project's Contribution Considerable?	Operation No

Construction

Construction of rail and road projects (Tables 4-3 and 4-4) and land development projects (Table 4-6) along with the Project could result in temporary land use impacts adjacent to the UPRR right-of-way because of temporary construction disruptions to existing land uses. However, road and rail projects would either occur within existing railroad or roadway rights-of-way or on vacant lands adjacent to such features (road/rail projects in Table 4-3 and 4-4). Land use development projects (Table 4-5) would displace the parcel's existing land use(s) with a new use but would have to go through local land use permitting processes to ensure consistency with local plans and policies. Therefore, none of the cumulative projects, in combination with the Project, is expected to result in a significant cumulative impact due to temporary disruption in construction related to divisions of a community, or conflicts with land use plans, policy, or regulations for the purpose of avoiding or mitigating an environmental effect.

Operations

Community Division

The majority of the Project would occur within the existing UPRR ROW, and operation of the Project would occur on an existing railroad corridor utilized by freight rail. The only cumulative project that would also use the UPRR ROW between Ceres and Merced is the Freight Rail Future Plans (#5). The existing railroad corridor already functions as a physical barrier and operation of the Project within the existing UPRR ROW would not result in new barriers in existing communities. Project facilities that are located outside the existing UPRR ROW consist of new station parking areas and the Merced Layover & Maintenance Facility. These new stations are located adjacent to the UPRR ROW, would not alter or impede connectivity and access in the communities where they are proposed, sever existing roads or crossings, or displace community uses. The Merced Layover & Maintenance Facility would be located in an industrial area and would not alter or impede connectivity and access in Merced, sever existing roads or crossings, or displace community uses. Thus, the Project's contribution to cumulative impacts related to community division during operations would be less than considerable.

Land Use Plan/Policy Consistency

The Project would generally be consistent with regional and local plans and policies, which emphasize providing energy-efficient alternatives to the automobile and promoting regional passenger rail services in the communities the Project would service. However, the Ceres to Merced Extension Alignment and the Merced Layover & Maintenance Facility are outside the existing UPRR ROW and are identified as being inconsistent with policies to preserve agricultural or biological resources. The potential cumulative impacts on the physical environment, related to biological resources and agricultural resources, is identified in Sections 4.2.5.4 and 4.2.5.6.

The Project's contribution to a cumulative impact on biological resources would be less than considerable after the implementation of mitigation. As such, the Project's contribution to cumulative impacts related to land use plan and policy inconsistencies (for the preservation of biological resources) during operation would be less than considerable with mitigation).

As identified in Sections 4.2.5.4, the Project would contribute considerably to a cumulative impact related to the conversion of agricultural uses to non-agricultural uses, which would be inconsistent with City of Merced and Merced County policies related to agricultural preservation. Even though this would be a land use impact due to an inconsistency with a policy to reduce environmental impacts (by preserving agricultural farmland), in order to not double-count this impact with Impact C-AG-1, this impact is not included for a second time in this section as a land use impact.

4.2.5.14 Noise and Vibration

The geographic context for potential cumulative noise and vibration-related impacts consists of the areas adjacent to and in the vicinity of the Project corridor. Cumulative projects within this geographic context include the projects listed in Tables 4-3, 4-4, and 4-6. The cumulative analysis for noise and vibration relies on a list approach.

Impact C-NOI-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on noise and vibration.

Level of Cumulative Impact	Construction and Operations Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	NOI-1.1: Implement a construction noise control plan NOI-3.1: Implement a construction vibration control plan NOI-4.1: Implement special trackwork
Project's Contribution Considerable?	Construction Yes Operations No

Construction

Noise

Depending on the facility, construction of the Project could last anywhere from 8 to 36 months. As described in Section 3.12, *Noise and Vibration*, construction noise impacts would be limited to residences within 135 to 270 feet from the Project construction site. For a cumulative impact to

occur, a cumulative project would need to be located near one of the sensitive receptors that the Project would affect and construction for the cumulative project would need to occur at the same time as the Project. The construction schedules for the cumulative projects are not currently known; therefore, it is not possible to determine at this time if there would be potential cumulative impacts. However, due to the proximity of some cumulative projects next to sensitive receptors, the potential exists for a cumulative noise impact to occur during construction.

Construction noise impacts for the Project would be greatest during work at locations where pile driving is required for bridge construction. Because most of the Project is located on an active rail line, construction work could occur during the nighttime. Nighttime construction near residential uses would have larger impacts than daytime construction and would result in a potentially significant impact. Even with Mitigation Measure NOI-1.1, which would require preparation of a noise control plan to reduce potential construction noise impacts, noise impacts would not necessarily be reduced at all times during construction to a less-than-significant level, particularly with the likelihood of substantial nighttime construction for the Project. Because there could be other cumulative projects simultaneously under construction adjacent to the Project, the Project could result in a considerable contribution to a cumulative noise impact during construction.

Vibration

As described in Section 3.12, construction vibration impacts would extend to distances of 230 to 630 feet from pile-driving operations, 100 to 240 feet for compacting, and less than 130 feet for bulldozers, depending on the vibration sensitivity of the land use category. Mitigation Measure NOI-3.1 would require preparation of a vibration control plan to reduce potential construction vibration impacts. Although there could be other cumulative projects simultaneously under construction adjacent to the Project, unlike noise, vibration levels do not to accumulate (like noise levels can). Thus, the Project's contribution to cumulative vibration impacts as a result of construction would be less than considerable with mitigation.

Operations

Noise

Cumulative noise would occur from the noise generated by trains operating within the UPRR ROW, on the Fresno subdivision, between Ceres and Merced. As shown in Table 4-4, a total of 48 trains would operate on the Fresno subdivision between Ceres and Merced (8 from this Project and 40 from the freight associated with Freight Rail Future Plans [#5]). From 2016 to 2040, the number of freight trains would almost double, which would result in an increase in noise of approximately 3 dB. This increase in noise due to freight would represent a significant cumulative impact. However, this significant cumulative noise impact would exist even without the Project and as shown in Section 3.13, the noise impacts from operation of the Project are less than significant. Thus, the Project would not contribute considerably to this cumulative noise impact.

Vibration

For operational vibration impacts, cumulative other regional transportation and land development projects would not likely have substantial effects on vibration levels due to traffic generation involving light duty and passenger vehicles. Increased vibration along roadways may occur at locations in very close proximity to heavy-truck traffic but would not otherwise be a significant impact. Cumulative rail project would be the largest contributor to vibration increases. Existing

vibration levels for freight at 100 feet from the outermost track varies between 73 and 81 VdB, which is considered representative for future freight service increases. These existing levels exceed the Federal Transit Administration annoyance thresholds of 72 VdB for immediately adjacent residences and of 75 VdB for immediately adjacent institutional buildings, but none approach structural damage thresholds. Because there would be at least a doubling of train events there would be the potential for cumulative operational vibration impacts for sensitive receptors located within 100 feet.

As described in Section 3.12, the Project would implement special trackwork (per Mitigation Measure NOI-4.1) in order to minimize vibration impacts to a less than significant level near three sensitive receptors. The Project would utilize an existing railroad corridor that is already utilized for freight rail traffic. Because of the high volume of existing freight train traffic in the area where Project operations would occur, the increase in passenger trains with Project operations would be very small. Thus, the Project's contribution to cumulative vibration impacts as a result of operations would be less than considerable.

4.2.5.15 Population and Housing

As described in Section 3.13, *Population and Housing*, the Project would have no impact related to displacing existing housing units or people. Cumulative impacts are addressed only for those thresholds that would result in a project-related impact. If the Project would result in no impact with respect to a particular threshold, it would not contribute to a cumulative impact. Therefore, no cumulative analysis related to displacing existing housing units or people is presented here; instead, the focus is on cumulative impacts related to induced population growth.

The geographic context for cumulative impacts on population and housing is the three counties (Stanislaus and Merced Counties) in which the Project would be located. Cumulative growth projections within this geographic context are summarized in Table 4-2. The cumulative analysis for population and housing relies on a projection approach.

Impact C-POP-1: Construction of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on population and housing. Operations of the Project would not contribute considerably to a significant cumulative impact on population and housing.

Level of Cumulative Impact	Construction Less than significant Operation Significant (see below in regard to the Project's contribution)
Applicable Mitigation Measures	None
Project's Contribution Considerable?	Operations No

Construction

As described in Section 3.13, *Population and Housing*, construction of the Project would have the potential to induce local population growth temporarily through employment of workers during the construction period. Similarly, construction of other identified projects would have the potential to induce local population growth temporarily through employment of workers during the

construction period. However, most employment opportunities for the Project and other cumulative projects are anticipated to be filled by local workers who already reside in the vicinity and would not contribute to population growth. Non-local labor would commute or temporarily relocate during the construction period; once construction is complete, non-local workers would return to their prior residence or move on to the next construction opportunity. Employment opportunities generated by construction of the Project and other cumulative projects is not anticipated to generate a new permanent population in improvement areas. Thus, the cumulative impact on population growth due to construction would be less than significant.

Operation

In general, a project may foster spatial, economic, or population growth in a geographic area if it removes obstacles to population growth (e.g., the establishment or expansion of an essential public service or the extension of a roadway to an area). Included in this definition are the cumulative rail and other regional transportation projects such as the California High-Speed Rail Project (#3) and other projects identified in Table 4-3, which could facilitate travel between areas of California by providing an additional mode of transportation. Generally, induced growth associated with cumulative rail and other regional transportation projects would be minimal and not substantial. These projects alone would not induce substantial population growth beyond that already projected for the region. The employment opportunities created by a large transportation project, such as the California High-Speed Rail Project (#3) would be filled by the existing local population.

The cumulative land development projects generally consist of commercial, industrial, institutional, office, and residential developments that would increase population and housing in the region. These land development projects may induce unplanned growth if the project is not consistent with local and regional land use plans. Growth associated with land development projects that are consistent with local land use plans is considered planned for and accounted for in the local jurisdiction's general plan. Many land development projects are consistent with current local land use planning; some of these projects seek general plan and zoning amendments to allow uses that are not consistent with current local planning. All land development projects must be approved by land use jurisdictions, which are required by law to amend local land use plans or make the appropriate findings prior to approving any inconsistent uses and associated growth. If these cumulative projects were to induce substantial population growth in the region that would exceed regional projects, the cumulative impact would be significant.

The potential for Project operations to induce population growth is generally associated with increasing accessibility to existing and new stations. The Project, particularly at existing and new stations, may induce population growth if the stations result in land use changes that would support intensified development. New stations would provide accessibility, proximity to transit services, and may be an attractive benefit consistent with intensified development. The additional growth may not necessarily be new net growth in a community. Rather, the growth may be a redistribution of planned growth that takes advantage of transit availability in the community. The extent to which a new station may indirectly induce unplanned growth is examined in light of local land use and development policies around the station area. Project stations are supported by the general plans of the municipalities in which new or replacement stations would be located as well as in regional plans. Where new stations are proposed, local growth and development policies generally support the establishment of these stations; as such, the population growth that may result in the station vicinity is already planned for. These policies call for land use intensification and uses that are supportive of transit in the areas where new stations are proposed and would suggest that induced

growth from a new station would not be substantial or unplanned. New stations could potentially intensify density surrounding stations, but this intensification would be a redistribution of planned growth taking advantage of transit availability in the community. Thus, the Project's contribution to cumulative induced population growth impacts as a result of operation would be less than considerable.

4.2.5.16 Public Services

The geographic context for cumulative construction impacts on public services is the Project corridor and vicinity. The geographic context for cumulative operation-related public services impacts includes the service area of the public service providers to the Project corridor. For construction impacts on public services, cumulative projects included within this geographic area are all projects listed in Tables 4-3, 4-4, and 4-5. The cumulative analysis for public services relies on both a list approach (for construction disruption) based on the projects listed in Tables 4-3, 4-4, and 4-5, and a projection approach (for operations).

Impact C-PS-1: Construction and Operations of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on public services.

Level of Cumulative Impact	Construction and Operations Less than significant
Applicable Mitigation Measures	TR-4.1: Implement a construction road traffic control plan

Construction

During construction of the identified projects, there could be a temporary increase in demand for public services throughout the region. However, the region already accommodates substantial numbers of construction projects. On a regional scale, the overall level of construction associated with the Project is not expected to substantially change existing demands on public services. Therefore, none of the identified projects, in combination with the Project, is expected to result in the need for new or physically altered public facilities or result in any significant cumulative impacts associated with construction of new public facilities.

Construction of the Project would include modified at-grade crossings and other improvements that could affect local roadways and streets and increase emergency response times. However, traffic impacts would be short-term and temporary. Nonetheless, the Project would implement Mitigation Measure TR-4.1, which requires the implementation of a construction road traffic control plan and would further minimize any impacts. The construction road traffic control would address temporary road closures, detour provisions, allowable routes, and alternative access. Traffic control plans would be implemented to ensure that adequate local emergency access would be maintained throughout the entire construction duration. Coordination with local jurisdictions on emergency vehicle access would be required as part of the traffic control plans to lessen these disruptions and to maintain access by firefighters, law enforcement, and emergency medical responders.

Accidents involving construction workers and equipment and increased potential for crime and vandalism at staging areas could result in increased need for public services; however, California Occupational Safety and Health Administration's Title 8 regulations require an emergency action plan that establishes protocol for any construction worker-related emergency scenarios and establishes

safety measures to prevent and respond to medical emergencies (California Occupation Safety and Health Administration 2005). As described in Section 3.13, *Population and Housing*, some construction workers are expected to reside locally, and therefore are already served by local public service facilities. Consequently, the construction labor force required to construct the Project would not result in a significant permanent increase in public service demand that could require new or altered facilities. Because traffic disruptions and the potential for construction-related accidents would be temporary, construction of the Project, in addition to the projects listed above, would not result in a permanent increase in public service demand that could require new or altered facilities. Additionally, Project construction would have no significant impacts on service ratios, or other performance objectives for schools and other public facilities, because construction would be temporary and would not generate growth beyond creating temporary employment opportunities, some of which would be filled locally. As such, Project construction, in combination with construction of any or all of the above listed projects, would not result in a significant cumulative impact.

Operations

Although Project operations would introduce passenger rail service to new areas, substantial localized growth is not anticipated around new station locations. As described in Section 3.13, *Population and Housing,* the general plans of the municipalities in which these new stations are proposed support the establishment of these stations. Thus, growth in and around new station areas would not be substantial or unplanned. The resultant demand for public services is expected to be minor and would not require new or altered public service facilities to maintain performance objectives. Thus, the cumulative impacts on public services as a result of operations would be less than significant.

4.2.5.17 Recreation

As described in Section 3.15, *Recreation*, the Project would have no impact on the environment with regard to the construction or expansion of recreational facilities (Impact REC-3). Cumulative impacts are addressed only for those thresholds that would result in a project-related impact. If the project would result in no impact with respect to a particular threshold, it would not contribute to a cumulative impact. Therefore, no cumulative analysis related to impacts associated with the construction or expansion of recreational facilities is presented here; instead, the focus is on cumulative impacts related to increased demand for or degradation of recreational facilities.

The geographic context for cumulative construction impacts on recreational resources is Project corridor and vicinity. The geographic context for operation-related recreational resources impacts is the jurisdiction that provides recreational resources in the vicinity of the Project. For construction disruption to recreational resources, cumulative projects included within this geographic area are all projects listed in Table 4-3. For operational impacts on recreational resources, cumulative growth projections within this geographic context are summarized in Table 4-2. As shown in Table 4-1, the cumulative analysis for recreational resources relies on both a projection approach (for recreational demand) and on a list approach (for construction disruption).

Impact C-REC-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on recreational resources.

Level of Cumulative Impact	Construction and Operations Significant (see below in regard to the Project's contribution)
Mitigation Measures	AES-1.1: Install visual barriers between construction work areas and sensitive receptors AQ-2.1: Implement advanced emissions controls for off-road equipment AQ-2.2: Implement advanced emissions controls for locomotives used for construction NOI-1.1: Implement a construction noise control plan
Project's Contribution Considerable?	Construction and Operations No

Construction

Construction of cumulative projects located on, adjacent to, or in close proximity to existing recreational resources could potentially disrupt use of the resource. Construction activities near recreational resources could result in temporary increases in noise and dust, and visual degradation experienced by users of these recreational resources. Construction of cumulative projects that are located on or partially on the site of a recreational resources could also require temporary construction easements within a recreational resource or the temporary closure or disruption to the use of a recreational resource. A cumulative construction-period impact on recreational resources is considered significant if these activities prevent the function of a recreational resource from continuing or would diminish the ability of users to use or access the recreational resource, leading to the increased use of other park areas, such that substantial physical deterioration of those facilities could occur, be accelerated, or require the construction or expansion of recreation resources that would result in an adverse effect on the environment.

Users of recreational resources in the vicinity of the Project (i.e., new stations and the Ceres to Merced Extension Alignment) would experience impacts involving visual degradation, and increased noise and dust during the construction period. Likewise, construction of the projects listed in Tables 4-3, 4-4, and 4-6 could result in similar impacts to the recreational resources that would be affected by construction of the Project. A summary of potential cumulative impacts is summarized below.

- The limits of the Ceres Downtown Specific Plan (#8) and a portion of the Ceres to Merced Extension Alignment are both located within the vicinity of the Ceres Whitmore Park. Because no specific projects have been identified for the Downtown Specific Plan that are also in close proximity to the Ceres to Merced Extension alignment and because trackwork is expected to last a few days to a week, no cumulative impact is expected with the Ceres Downtown Specific Plan (#8).
- The improvements to Golden State Boulevard (#6) and a portion of the Ceres to Merced Extension Alignment and Turlock Station would be located within the vicinity of Summerfaire Park and Donnelly Park.
- Two cumulative projects (#18 and #19) and a portion of the Ceres to Merced Extension Alignment would be located within the vicinity of Broadway Park. Because trackwork is expected to last a few days to a week and because Broadway Park is separated from the two cumulative projects (#18 and #19) by buildings, no cumulative impact is expected.

- Once cumulative projects (#20) a portion of the Ceres to Merced Extension Alignment would be located within the vicinity of Central Park in Turlock. Because trackwork is expected to last a few days to a week and because Central Park is separated from the cumulative project (#20) by buildings, no cumulative impact is expected,
- The improvements to SR 99 (#6) and portions of the Ceres to Merced Extension Alignment are both located within the vicinity of Shattuck Educational Park and Aileen Colburn Elementary School. Because trackwork is expected to last a few days to a week, the potential to overlap with the improvements to SR 99 (#6) is low and a potential cumulative impact would be unlikely.
- The improvements to SR 99 (#6) and portions of the Ceres to Merced Extension Alignment are both located within the vicinity of the Merced River. The construction of the bridge over the Merced River could last 14-36 months. As such, there is the potential for an overlap in construction, which could result in a significant cumulative impact.
- The improvements to SR 99 (#6) and portions of the Ceres to Merced Extension Alignment and the Livingston Station are both located within the vicinity of Selma Herndon Elementary School, and Aileen Colburn Elementary School. The construction of the station could last 12 months. As such, there is the potential for an overlap in construction, which could result in a significant cumulative impact.

The duration of construction-period impacts varies between a few days to a week (track work) and 12 to 36 months (station and railroad bridges), depending on the facility constructed. Although construction would be temporary, the duration of construction activities could impair access to or the quality of existing recreational facilities. For a cumulative impact to occur, the construction period for the Project and the construction period for the identified project would have to overlap for a substantial period, such that access would be impaired. As summarized above, the potential for a cumulative impact to recreational resources located near the Ceres to Merced Extension Alignment would be low, since construction along the alignment would last only a few days to a week. However, there are some locations where construction for the Project would last months; where the construction is located near a recreational resource; and where there is also another cumulative project located nearby. Thus, the Project in combination with the construction of other nearby projects, would constitute a potentially significant cumulative impact.

The Project would require the implementation of Mitigation Measures AES-1-1, AQ-2.1 through AQ-2.2, and NOI-1.1, which would require the installation of visual barriers between stationary construction work areas and sensitive recreational receptors; require advanced emissions controls, and the preparation of a construction noise plan. These mitigation measures would limit the visual exposure of construction activities, minimize potential construction air quality and dust impacts, and noise of construction activities to users of nearby recreational resources. Thus, the Project's contribution to cumulative impacts on recreational resources because of construction would be less than considerable with mitigation.

Operations

Operation of cumulative rail and other regional transportation projects would not induce substantial population growth beyond that already projected for the region. These projects alone would not induce substantial population growth, requiring the need for additional recreational resources to sustain the population. Cumulative land development projects and general regional growth would increase demands for recreational resources. The cumulative demands for recreational resources

could result in the need for additional recreational facilities. Depending on where the new facilities are proposed, this could result in significant impacts on the environment during construction and operation of new recreational facilities.

Although Project operations would introduce passenger rail service to new areas, substantial localized growth is not anticipated around existing and new station locations. As described in Section 3.13, *Population and Housing*, the general plans of the municipalities in which these new stations are proposed support the establishment of these stations. Thus, growth in and around new station areas would not be substantial or unplanned. The resultant demand for existing recreational resources is expected to be minor and substantial physical deterioration is not anticipated to occur necessitating the construction for new facilities. Thus, the Project's contribution to cumulative impacts on recreational resources as a result of operations would be less than considerable.

4.2.5.18 Safety and Security

As described in Section 3.16, *Safety and Security*, there would be no impacts on airports or airport land use plans from the Project that could result in a safety hazard. Cumulative impacts are addressed only for those thresholds that would result in a project-related impact. If the project would result in no impact with respect to a particular threshold, it would not contribute to a cumulative impact. Therefore, no cumulative impact analysis of safety hazards related to airports is presented here; instead, the focus is on cumulative impacts related to emergency response and evacuation, wildland fire hazards, and rail hazards.

The geographic context for cumulative safety and security impacts consists of the areas adjacent to and in the vicinity of the Project corridor. Cumulative projects within this geographic context include the projects listed in Tables 4-3, 4-4, and 4-6. The cumulative analysis for safety and security relies on a list approach.

Impact C-SAF-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on safety and security.

Level of Cumulative Impact	Construction and Operations Significant (see below in regard to the Project's contribution)
Mitigation Measures	TR-4.1: Implement a construction road traffic control plan
Project's Contribution Considerable?	No

Construction

Emergency Response and Evacuation

Construction of the cumulative projects listed in Tables 4-3, 4-4, and 4-6 may increase traffic volumes due to the additional presence of construction trucks and equipment on local roadways and streets. Increased traffic volumes and circulation and traffic obstructions could affect the ability of emergency responders to reach their destinations in a timely manner, thereby potentially interfering with evacuation capabilities in constrained areas in the event of an emergency. Where one or more projects has construction activities occurring at the same time and in the same area, impacts to emergency response times and evacuation routes could be significant.

Construction of the Project could increase traffic congestion and vehicle wait time from construction vehicles. Although added construction traffic would be short-term and temporary, and in some cases periodic over multiple seasons, the construction impact on traffic operations could interfere with emergency response and evacuation. However, implementation of Mitigation Measure TR-4.1 would require the preparation of a construction road traffic control plan, which would ensure that adequate local emergency access would be maintained throughout the entire construction duration. As a result of this mitigation, coordination with local jurisdictions on emergency vehicle access would be included to mitigate these disruptions and to maintain access by firefighters, law enforcement, and emergency medical responders. In addition, the construction road traffic control plan would address temporary road closures, detour provisions, allowable routes, and alternative access. Thus, the Project's contribution to cumulative impacts related to emergency response or evacuation as a result of construction would be less than considerable with mitigation.

Wildland Fire Hazards

There are no very high or high wildfire hazard zones in the vicinity of the Project; however, there are small pockets of moderate fire hazard severity zones in the vicinity of Project, near Keyes, Delhi, and Atwater (see Figure 3.16-1).

Construction of cumulative projects near these small pockets of moderate fire hazard severity zones may increase fire risk by performing construction activities with the increased potential to ignite wildfires (use of hydrocarbon fuels, operation of combustion engine equipment, etc.). It is assumed that construction of these identified projects would be in accordance with all requirements established by the County Fire Marshal's office, as well as local jurisdictions, and all other applicable fire code regulations to reduce the potential for fires. With implementation of these requirements, construction of cumulative projects and the Project would not be expected to expose people or structures to a significant wildfire risk and would not exacerbate wildfire risks. Thus, there would not be a significant cumulative impact related to wildfire hazards during construction.

Operations

Emergency Response and Evacuation

During operation of the Project, existing traffic patterns would be maintained, and emergency response route needs would be met. Localized traffic delay impacts may occur at at-grade crossings when the railroad gates are down; however, the typical gate-down time would be approximately 1 minute for ACE passenger train services. Despite these localized traffic delay impacts, emergency vehicle response times are a function of travel along the entire path from their base to the incident location. Project operations would substantially reduce overall VMT in the Project corridor, which would generally reduce congestion. Most of the VMT reductions would be during peak hours, which is especially important in reducing congestion. This broad-based congestion improvement is expected to more than offset the localized effects at individual at-grade crossings and near Project stations, resulting in a net improvement (compared with the No Project Conditions) in emergency response times. Thus, the Project's contribution to cumulative impacts related to emergency response or evacuation as a result of operation would be less than considerable.

Wildland Fire Hazards

Although there are moderate fire hazard severity zones in the vicinity of the Project, these areas are non-contiguous and are limited in number. Operation of new passenger trains within the existing UPRR ROW would be unlikely to expose more individuals to wildfire risk. Trains would not operate where there is a safety risk to the train and its passengers due to wildfire. The existing UPRR ROW would continue to be maintained according to ACE's and UPRR's existing maintenance and management standards. Vegetation maintenance would reduce potential fire fuel along the tracks or cover the area along the tracks with nonflammable materials. In addition, operations of new stations would be in compliance with applicable building code and fire code regulations per city, county, and state requirements. Thus, the Project's contribution to cumulative operations impacts related to wildland fire hazards would be less than considerable.

Rail Hazards

Freight Rail Future Plans (#5) would result in an increased number of freight trains along railway corridors, including the Project corridor; this increase has the potential to increase railway hazards such as train derailment and collisions at at-grade crossings, resulting in a potentially significant cumulative impact.

Based on the characteristics of the Project improvements (e.g., physical changes to existing infrastructure, such as new tracks, upgrades to tracks, or installing a bridge), these improvements would not be expected to increase safety hazards or risks to workers, passengers, or adjacent human and environmental receptors. Project improvements that entail new or upgraded tracks would occur primarily within the existing UPRR ROW and would improve the conditions of existing tracks. New stations would be designed to applicable city and county standards for safety.

Operational errors related to speed and braking of a train is a major cause of derailments around sharp curves, steep grades, and turnout points. Inertia acts in the opposite direction of acceleration when a train goes around a curve. An imbalance between acceleration and inertia could cause a train to overturn (Bibel 2013). Also, when traveling over steep grades, speed is very important. Trains traveling uphill must maintain a continuous minimum speed because traveling up a hill too slowly could cause derailment. Trains traveling downhill must not exceed a maximum speed. Speed limits around curves, through canyons, and on steep grades will be strictly followed. Steep grades and sharp curves are generally not present within the Project corridor between Ceres and Merced, which is predominantly flat and where the alignment is generally straight. To prevent accidents caused by failing wheels and brakes, trains would be routinely checked and maintained.

Overall, Project operations are not anticipated to increase rail hazards for the following reasons.

- All new tracks would be designed to meet operational and safety standards, and train speed would be limited when traveling on sharp curves and steep grades.
- Stringent federal and state protocols, regulations, and requirements intended to reduce the likelihood of accidents/incidents would be strictly followed.
- The Projects would not change the type of cargo freight trains carry.
- UPRR's hazardous materials management measures would avoid or minimize any accidents/incidents involving freight, which include the following (Union Pacific Railroad n.d.).
    - The UPRR Hazardous Materials Management Group, which consists of experts in hazardous material transportation safety, securement, and response.

- The UPRR Hazardous Materials Emergency Response Plan, a performance-based plan that provides guidance about reporting a release as well as a list of training requirements for those responding to an incident.
- Extensive resources such as booms, transfer trucks, liquid-only transfer trailers, fire trailers, and foam caches.
- Highly trained hazardous materials responders.
- A 24-hour emergency community hotline in the event of a derailment or hazardous materials release.
- A comprehensive network of certified hazardous materials contractors.

Additionally, the Project and any future freight would adhere to Federal Railroad Administration (FRA) rules, regulations, and guidelines for the operation of trains which would include implementation of safety measures, compliance with strict maintenance and reporting requirements, and implementation of the Positive Train Control (PTC) system designed to automatically stop a train before certain accidents occur. In particular, PTC is designed to prevent train-to-train collisions, derailments caused by excessive train speeds, and train movements through misaligned track switches. Adherence to the FRA rules, regulations, and guidelines would reduce the potential for derailment, train-to-train collisions, and the release of hazardous materials. In addition, the accident rate for Project operations would be similar to the historic national commuter rail safety data for ACE because the same safety protocols, rules, regulations, and technology would be utilized for the improvements. Thus, the Project's contribution to cumulative operations impacts related to rail hazards would be less than considerable.

4.2.5.19 Transportation

The geographic context for the analysis of cumulative impacts on transportation varies by subject area. For construction impacts, the geographical area is the Project corridor and vicinity. For operations impacts, the geographic focus of the analysis is the transportation network at and near the Project, but may also include components of the circulation system at specific locations outside of this area that may be affected by the Project, such as where transit systems would connect to the ACE system (e.g., the Valley Link Project.

The cumulative analysis for transportation primarily relies on a list approach, and considers the projects listed in Tables 4-3, 4-4, and 4-6. The analysis of cumulative impacts due to project construction, for example, considers the subset of those projects in Tables 4-3, 4-4, and 4-6 within the geographic context for construction impacts (i.e., the Project corridor and vicinity). However, a projection-based approach is applied for some components of the analysis of cumulative impacts due to Project operations.

Impact C-TR-1: Construction and Operations of the Project would not contribute considerably to a significant cumulative impact on transportation.

Level of Impact	Construction and Operations Significant (see below in regard to the Project's contribution)
Mitigation Measures	TR-1.1: Implement construction railway disruption control plan TR-4.1: Implement construction road traffic control plan
Project's Contribution Considerable?	Construction and Operations No

Construction

Roadway, Transit, Pedestrian, Bicycle Systems, and Emergency Vehicle Access

During construction, identified projects could disrupt transit, roadway, bicycle, or pedestrian facilities, which could conflict with programs, plans, ordinances, or policies addressing the circulation system; substantially increase hazards; and/or result in inadequate emergency access. In general, potential effects would be more substantial for transportation projects, which may require substantial, if temporary, changes to the circulation system to accommodate construction activities. However, land use development and other identified non-transportation projects could also result in effects in cases where such projects similarly propose substantial changes to the circulation system to facilitate construction (e.g., roadway closures, transit stop relocations, etc.).

Considering the Project in conjunction with identified projects, potential effects on transportation may be amplified where construction activities are in close proximity or when they take place concurrently. Standard construction practices and regulations require construction contractors to work with relevant parties (e.g., public works departments, transportation agencies, transit service providers) to coordinate construction activities and identify, avoid, and minimize disruptions to the circulation system. Despite these requirements, however, it is possible that cumulative construction effects could reach the level of a significant impact.

The Project would require implementation of Mitigation Measure TR-4.1, which would require the preparation of a construction road traffic control plan that would ensure adequate local emergency access is maintained throughout the entire construction duration. As part of this mitigation, safety protocols would be implemented to ensure safe travel for existing transit, pedestrians, and bicyclists. As a result of this mitigation, coordination with local jurisdictions on emergency vehicle access would be included to mitigate these disruptions and to maintain access by firefighters, law enforcement, and emergency medical responders. In addition, the construction transportation plan would include a traffic control plan that would address temporary road closures, detour provisions, allowable routes, and alternative access. Thus, the Project's contribution to cumulative impacts related to roadways systems; transit, pedestrian, and bicycle systems; and emergency vehicle access as a result of construction would be less than considerable with mitigation.

Freight Rail Service

Project improvements include constructing a new main track within the UPRR ROW, upgrading existing track within the UPRR ROW, and establishing new stations along the alignment. In addition, new stations would be established along the extension alignment between Ceres and Merced, with new station platforms and other features within the UPRR ROW. Construction work involving installation of new or upgraded tracks would occur primarily within the existing UPRR ROW, where freight trains currently operate. In all cases, construction of the Project would involve construction equipment operating within the UPRR ROW, with the potential in many locations for temporary disruptions to UPRR freight service, particularly along existing single-track alignment sections. The work may require temporary track shutdowns at night that would result in temporary suspension of freight service in constrained areas. However, implementation of Mitigation Measure TR-1.1 would require a railway disruption control plan during construction to minimize impacts. Thus, the

Project's contribution to cumulative construction impacts related to freight rail service would be less than considerable with mitigation.

Operations

Roadway, Transit, Pedestrian, Bicycle Systems

The Project is one of many projects in the planning phase to address increased demand on alternative modes of transportation as a result of regional growth. Table 4-3 includes a number of key other transit projects as well, but there are many other regionally significant transit improvement efforts not listed because they are in locations more distant from the Project.

Project operations would not conflict or create inconsistences with adopted transit plans, guidelines, policies, or standards adopted by study area cities, counties, SJRRC, or the State of California. Many jurisdictions are locating pedestrian and bicycle facilities in locations near and complementary to ACE station areas. In some instances, pedestrian and bicycle infrastructure enhancements are included in a city's or county's pedestrian or bicycle plan, such as the Stanislaus Council of Governments *Non-Motorized Transportation Master Plan*; and *Merced County Regional Bicycle Transportation Plan*. On the city level, ACE is a beneficial component of general plans. On the regional level, the Project is consistent with the regional transportation plans for the Stanislaus County Association of Governments and Merced County Association of Governments. The Project is one of the major projects included in these documents, which serve as the sustainable communities strategies/regional transportation plans (SCS/RTP) for the respective areas, integrating transportation and land-use strategies to manage GHG emissions and plan for future population growth. On the state level, the Project is consistent with the state's blueprint for meeting future mobility needs. Thus, the Project's contribution to cumulative operations impacts related to roadway transit, pedestrian, and bicycle systems would be less than considerable.

Ridership and Impact on Connecting Roadway, Transit, Pedestrian, and Bicycle Systems

Project operations might result in induced ridership for other systems that would result in changes in physical conditions, such as through the construction of additional transportation infrastructure to address the increased ridership.

The largest induced ridership increase for shuttle systems would be at the Great America Station for ACE/Santa Clara VTA shuttles and Santa Clara VTA light rail, followed by the Pleasanton Station for ACE/Wheels shuttles, Contra Costa Transportation Authority (CCTA) bus service, and private shuttles. A total of eight bus shuttle routes and a light rail line serve the Great America Station, and will continue to do so in 2040. As part of the Project, SJRRC will contribute additional funding towards additional ACE/Santa Clara VTA and ACE/Wheels shuttle service commensurate with growth in ACE ridership under the Year 2040 conditions with the Project. To accomplish this, the SJRRC may need to run more or longer shuttles. The ACE shuttles are critical to supporting ACE ridership and the continued ACE and regional goal to reduce VMT. This EIR identifies that the increase in ridership from the Project would require additional shuttles at the Great America and Pleasanton Stations. This Project would include the additional daily shuttles to meet the additional demand from the Project.

The additional riders anticipated with Project operations are for the day and will be spread across the entire AM and PM service profiles. For example, four distinct train arrivals in the AM hours are being met by ostensibly the same fleet of shuttle buses (as under Year 2040 No Project Conditions),

which are making additional trips to serve ACE riders associated with additional future trains. While the increased demand may increase the need for ACE shuttles and other bus/light rail services, given that ACE facilities already facilitate these connections, the actual increase due to induced ridership is not expected to result in substantial new capital improvements for ACE/Santa Clara VTA, Wheels, San Joaquin Regional Transit District, and Modesto MAX beyond what they would plan for without Project operations. A similar conclusion applies for separate, local public transit services, all of which are estimated to have increases of less than 1 percent due to induced ridership from Project operations. Although these increases by themselves are not expected to require substantial new facilities, they would contribute to the need for bus shelters, stops, and maintenance facilities. Like SJRRC, other transit providers must plan for future needs and construct the facilities to meet the associated system rider demands as feasible, given funding availability.

The ACE Extension to Merced Project will contribute riders to the HSR system when it is completed to Merced and to the Valley Link Project when completed to North Lathrop. These projects, when completed, will also contribute riders to the ACE system. In terms of transit, these increases in ridership are benefits to each of the systems, as robust ridership is an essential part of the financial health for transit systems.

There may be increased demand for transit vehicles and potentially station modifications to handle increased ridership volumes. Because infrastructure improvements for transit services other than ACE and their funding are outside the responsibility of SJRRC, the responsibility for managing the environmental effects of any additional transit facilities or services that might be necessary to meet future demands lies with each transit operator. For future improvements that may be necessary to accommodate increased ACE shuttle service due to increased ridership from Project operations, such as shuttle bus stops, shelters, or other facilities, SJRRC will be required to complete the appropriate state (and federal if required) environmental review for such improvements and adopt feasible mitigation for any significant environmental impacts thus identified. For future improvements that may be necessary to accommodate increased other transit service due to increased ridership from Project operations, the responsible transit operators will be required to complete the appropriate state (and federal if required) environmental review for such improvements, and adopt feasible mitigations for any significant environmental impacts thus identified. At this time, it appears unlikely that the relatively modest increases in ridership for other transit services due to Project operations would require the construction of additional transit infrastructure.

Increased ridership from the Project would cause increased volumes at pedestrian and bicycle facilities surrounding and providing access to ACE stations. The existing pedestrian and bicycle facilities are generally under capacity and capable of accommodating increased pedestrian and bicycle volumes at stations. Thus, the Project's contribution to cumulative operations impacts related to increased ridership and induced demand for transit, pedestrian, and bicycle systems would be less than considerable.

VMT Impacts

The cumulative VMT impacts have not been estimated. The passenger rail projects shown in Table 4-3 are expected to reduce VMT by diverting individuals using vehicles to transit; the other regional transportation projects in Table 4-4 could increase VMT; and the land development projects could also increase VMT. Nonetheless, as shown in Table 3.17-2, the Project (with the Livingston Station) is expected to reduce VMT annually by 24.0 million miles in 2030 and 30.7 million miles in 2040.

Therefore, the Project would not represent a considerable contribution to any cumulative VMT impact.

Hazard Impacts

The design and function of each identified cumulative project and its interface with the circulation system would be governed by applicable standards from Caltrans and local city and county agencies. Land use development, for example, would be subject to applicable site access and design standards, including on-site transit, roadway, bicycle, and pedestrian facilities and any interface with corresponding off-site components of the circulation system. In addition, some transportation-related projects may specifically include components to address deficiencies in the existing circulation system or would otherwise reduce or eliminate hazards. Given these considerations, cumulative impacts related to transportation hazards would be less than significant.

Emergency Access Impacts

Physical changes and other effects on the circulation system due to identified projects—including increased demand on transit, roadway, bicycle, and pedestrian facilities—could affect emergency access. Changes to the roadway network, for example, may affect the preferred routes that emergency vehicles choose to take, while increased automobile traffic and other activity may result in a slight increase in response times for emergency vehicles. It is unlikely, however, that these changes would rise to the level of a significant impact by precluding emergency access to, from, or through specific areas or by substantially increasing travel times for emergency vehicles.

As mentioned in Section 3.17, *Transportation and Traffic*, emergency vehicles are permitted to use transit-only lanes or other vehicle-restricted lanes and are generally not subject to traffic control devices, and would therefore be able to bypass other vehicles, including any localized traffic congestion. California Vehicle Code section 21806 also requires that other vehicles yield right-of-way to emergency vehicles. Given these considerations, cumulative impacts related to emergency access would be less than significant.

Freight Rail Service

SJRRC would work with UPRR on the accommodation of new ACE rail service between Ceres and Merced, where a second main track would be implemented. The additional track would allow continued accommodation of current and future planned UPRR freight service with minimal disruption. With this continued accommodation of freight service, no indirect impacts such as diversions of truck freight traffic would result. Thus, the Project's contribution to cumulative operations impacts related to freight rail service would be less than considerable.

4.2.5.20 Utilities and Service Systems

The geographic context for cumulative construction impacts on utilities and service systems is the Project corridor and vicinity. The geographic context for the cumulative analysis of operation-related utilities and service systems impacts includes the service area of the utilities and service systems providers to the Project corridor. For construction disruption to utilities and service systems, cumulative projects included within this geographic area are all projects listed in Tables 4-3, 4-4, and 4-6. For operational impacts on utilities and service systems, cumulative growth projections within this geographic context are summarized in Table 4-2. As shown in Table 4-1, the

cumulative analysis for utilities and service systems relies on both a projection approach (for operations) and on a list approach (for construction disruption).

Impact C-USS-1: Construction of the Project, in combination with other foreseeable projects in the surrounding area, would not result in a significant cumulative impact on utilities and service systems. Operations of the Project would not contribute considerably to a significant cumulative impact on land use and planning.

Level of Cumulative Impact	Construction Less than significant Operations Significant (see below in regard to the Project's contribution)
Mitigation Measures	None
Project's Contribution Considerable?	Operations No

Construction

Disruption to Utilities

Construction of both the Project and cumulative projects in Tables 4-3, 4-4, and 4-6 could disrupt utilities or require utilities to be relocated. However, the agencies affiliated with these projects would work with local utility service providers to address the potential for utility disruption during construction, and to minimize service interruptions. Projects identified in Tables 4-3, 4-4, and 4-6 that would also potentially interrupt utility operation during construction would also be required to comply with all noticing and coordination requirements pertaining to utility services. Due to these requirements, there would not be a significant cumulative impact related to utility disruption.

Demand for Utilities Infrastructure

Construction of the Project, as well as the projects listed in Tables 4-3, 4-4, and 4-6 would require water and electric power and would generate wastewater and stormwater runoff. Local water providers have available capacity to serve the temporary, incremental demands associated with construction of the Project. The electric power required for construction would be minimal and would not be expected to require the construction of new or expanded electric power facilities. Wastewater generated during construction would be accommodated at existing wastewater treatment facilities and would not require new or expanded water or wastewater treatment facilities. These increases, as well as water and power service needs anticipated for identified project construction, are not expected to be substantial, would often be served locally by water tanks and generators, and would be temporary in nature. Thus, there would not be a significant cumulative impact related to demand for utilities infrastructure during construction.

Stormwater runoff generation for construction of the Project and cumulative projects would be managed through compliance with site-specific SWPPPs, as required by the NPDES program, and is not expected to be substantial during construction activities. As such, Project construction, in combination with construction of identified projects, would not result in a significant cumulative impact related to stormwater generation.

Landfill Capacity

Construction activities generate construction and demolition waste such as concrete, rubble, fill, and different types of building materials. State and local standards require that contractors divert construction and demolition waste from landfills by reusing or recycling construction and demolition materials. Per CALGreen (Cal. Code Regs. Title 24, Part 11, Section 5.408.1, Construction Waste Diversion) requires that 65 percent of construction and demolition waste generated during construction be recycled or diverted from the waste stream (International Code Council 2017). Compliance with CALGreen requirements would assist in the attainment of solid waste reduction goals, and would reduce the amount of solid waste that would be disposed of in landfills during both Project construction and the construction of cumulative projects subject to the same regulatory requirements. Furthermore, landfill facilities in the project vicinity, including those identified in Table 3.18-3 have sufficient remaining capacity (or a throughput) that would accommodate the demand for waste disposal. Therefore, there would not be a significant cumulative impact related to landfill capacity.

Operations

Demand for Utilities Infrastructure

Operation of the Project and the cumulative projects listed in Tables 4-3, 4-4, and 4-6, including a variety of residential, commercial, and land use projects, would result in increased electricity, natural gas, and water demands, as well as increased wastewater and stormwater generation.

There are several identified development projects that would require water for drinking and irrigation and would generate wastewater, potentially resulting in a significant cumulative impact related to demand for water and wastewater infrastructure. The primary demand for utilities infrastructure associated with Project operations would be water demand and wastewater generation associated with landscape irrigation at new stations and associated with maintenance activities. No restrooms are proposed at the stations and, thus, there would be no water demand or wastewater generation associated with this use. Landscaping and maintenance for the Project would not contribute to a substantial increase in water demand. The new stations would be required to comply with each respective municipalities' water efficient landscaping and irrigation ordinances pursuant to statewide Green Building Standards. Other cumulative projects that include landscaping would also be required to comply with these ordinances. Additionally, local water providers would have available capacity to serve the incremental demands associated with landscape irrigation at new stations. As described in Section 3.18, wastewater could be generated at the Merced Layover & Maintenance Facility and would be less than 1 percent of the local jurisdiction's anticipated supply at the time of buildout of the Project. The Merced Layover & Maintenance Facility would be required to comply with the Industrial General Permit, which requires the use of best management practices, best available technology economically achievable, and best conventional pollutant control technology to reduce and prevent discharges of pollutants to meet applicable water quality standards. Given the low water demand and wastewater generation as described above for the Project, the Project would not have a cumulatively considerable operational contribution to demand for water and wastewater infrastructure.

At this time, the total amount of electrical power and natural gas needed for all of the identified projects is unknown. Nor is it known if the power and natural gas facilities in the area can meet future demands. Therefore, there could be a potentially significant cumulative impact related to

demand for electric power and natural gas infrastructure. The Project is estimated to result in only a slight increase in electricity demand resulting from new stations and the Merced Layover & Maintenance Facility. The amount of natural gas needed for the Merced Layover & Maintenance Facility is anticipated to be minor as well. Thus, the Project would not have a cumulatively considerable operational contribution to demand for electric power or natural gas infrastructure.

For the Project and all identified projects, stormwater treatment facility design would be required to comply with all state and local requirements for storm drain design, including integration of site-specific post-construction stormwater controls. The Project would include such control strategies, in adherence to state and local requirements. Because all identified projects would be required to meet stormwater requirements, there would not be a significant cumulative impact related to stormwater generation.

Landfill Capacity

Solid waste generation associated with operation of the Project would be limited to new stations and the Merced Layover & Maintenance Facility. As described in Section 3.18, it is anticipated that Project operations of new stations and the Merced Layover & Maintenance Facility would generate an additional 106.2 tons of waste annually, which is approximately an additional 212,400 pounds of solid waste annually. Solid waste facilities that serve the new stations would have capacity to accommodate projected increases in solid waste disposal, and the additional solid waste generated by operations would be within the capacity of local landfills. Waste diversion measures for new stations would be implemented in accordance with local regulations. In addition, waste diversion measures would be implemented for cumulative projects. Due to the implementation of these waste diversions measures, there would not be a significant cumulative impact related to landfill capacity.

4.3 Significant and Unavoidable Environmental Impacts

Impacts related to the following topics would remain significant and unavoidable with the implementation of mitigation.

- Construction
    - *Agricultural Resources. Agricultural Resources:* Portions of the Project corridor span urban/developed lands, but other portions span agricultural resources, including Important Farmland. Permanent conversion of Important Farmland to nonagricultural uses would occur where the Project would be constructed on such agricultural resources. The Proposed Project (due to the Ceres Extension Alignment and Merced Layover & Maintenance Facility) would result in significant and unavoidable impacts to agricultural resources resulting from the conversion of Important Farmland. Additionally, because other identified projects that would convert Important Farmland would be constructed within the Project vicinity, the Project would result in a cumulatively considerable contribution to agricultural resources impacts.
    - *Noise*: As described in Section 3.12, construction of the Project would require construction activities in the daytime, and possibly nighttime, in order to maintain existing freight rail service. Although mitigation in the form of implementing best practices to minimize construction noise would reduce impacts in many locations, this mitigation might not

always reduce impacts during nighttime construction to a less-than-significant level. Construction period noise impacts would remain significant and unavoidable. Additionally, because there could be other cumulative projects simultaneously under construction, the Project would result in a cumulatively considerable contribution to noise impacts during construction.

4.4 Significant and Irreversible Environmental Changes

SJRRC proposes to extend ACE passenger rail service from Ceres to Merced by constructing and upgrading tracks within the existing UPRR Fresno Subdivision ROW, a distance of approximately 34 total miles. New stations and the Merced Layover & Maintenance Facility would also be constructed in the Lathrop between Ceres and Merced.

Construction of the Project would require the use of materials such as steel and copper, as well as fossil fuels, during construction. The source metals used, unless they come from recycled materials, would represent an irreversible use of resources. Fossil fuels used during construction would also represent an irreversible use of oil and natural gas.

Operation of the Project would require renewable diesel fuel for propelling the trains, fuel for vehicle shuttle operations, and energy use at new stations and at the Merced Layover & Maintenance Facility. However, the Project would also result in a reduction in vehicle fuel use due to the displacement of VMT. A quantitative energy demand analysis was conducted for the Project. As shown in Table 3.6-9, The Project (with the Livingston Station) would result in net energy savings of approximately 50.2 billion Btu per year in 2030 and approximately 70.1 billion Btu per year in 2040, compared to the No Project Conditions. As shown in Table 3.6-9, The Project (with the Atwater Station Alternative) would result in net energy savings of approximately 51.4 billion Btu per year in 2030 and approximately 71.4 billion Btu per year in 2040, compared to the No Project Conditions. The use of renewable diesel for Project operations would involve the use of oils, fats, or other waste products to create a fuel that is chemically identically to petroleum-based diesel fuel. Renewable diesel can be used in pure room (i.e., R100, or 100 percent renewable diesel) or blended with petroleum-based diesel in other proportions (i.e., R20, R5) (U.S. Energy Information Administration 2020). It is not known at this time what the precise fuel blends would be for Project operations, but even the use of a blend, such as R20, would be a continuance of non-renewable fossil fuel usage. It is possible that Project operations would use R100 and, in that case, would not cause a continuance of non-renewable fossil fuel usage. To the extent that electricity supplying the Project comes from non-renewable sources (natural gas, coal, nuclear), it would represent an irreversible use of those resources but due to the offset of vehicle fuel use, the Project would have a net reduction in the irreversible use of fossil fuels.

Permanent visual alterations would result from new stations, the Merced Layover & Maintenance Facility, and associated railroad features such as new railroad bridges, at-grade crossings, and retaining walls. Additionally, trees and mature vegetation would be removed and pruned. Some trees and vegetation would not be replaced onsite, resulting in a physical and aesthetic permanent change in certain locations. As documented in Section 3.1, these physical changes would alter views from residential viewers, roadway travelers, and recreationists and would also result in a new

source of lighting in various locations along the Project corridor. These changes would be significant and irreversibly alter current landscapes and viewsheds.

The Ceres to Merced Extension Alignment and the Merced Layover & Maintenance Facility would be constructed within or adjacent to Important Farmland, including Prime Farmland, Unique Farmland, and Farmland of Statewide or Local Importance. Where Project facilities would be constructed within Important Farmland, such agricultural resources would be permanently converted to a nonagricultural use. These impacts would be significant and irreversible.

4.5 Growth-Inducing Impacts

CEQA requires a consideration of a project's capacity to induce growth. Growth inducement would occur if the amount of population or employment growth projected to take place as a result of the Project were to exceed planned levels. Increased development and growth in an area are dependent on a variety of factors, including employment and other opportunities; availability of developable land; and availability of infrastructure, water, and power resources.

A growth inducement analysis was conducted for the Project, as described in Section 3.13, *Population and Housing*. As described in Section 3.13, the Project would have the potential to induce population growth around new stations between Ceres and Merced due to increased accessibility permitted by the expansion of transit services. The Project, particularly at existing and new stations, may induce population growth if the improvements result in land use changes that would support intensified development. The growth-inducement analysis determined that the Project is supported by the general plans of the municipalities in which new or replacement stations would be located. Where new stations are proposed, local growth and development policies generally support the establishment of these stations; as such, the population growth that may result in the station vicinity is already planned for in various planning document policies. These policies call for land use intensification and uses that are supportive of transit in the areas where new stations are proposed and would suggest that induced growth from a new station would not be substantial or unplanned. New stations could potentially intensify density surrounding stations, but this intensification would be a redistribution of planned growth taking advantage of transit availability in the community. These new stations are considered beneficial and complementary to land use and future growth plans.

Additionally, although the Project would introduce new passenger rail service from Ceres to Merced, these are developed areas with an existing well-established rail corridor currently used for freight rail only. The Project would serve developed areas and would not extend service to or provide access to undeveloped areas.