

California High-Speed Rail Authority

San Francisco to San Jose Project Section

Final
Environmental Impact Report/
Environmental Impact Statement

Final CEQA Findings of Fact and
Statement of Overriding
Considerations

August 2022



The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
AB	Assembly Bill
ATP	archaeological treatment plan
Authority	California High-Speed Rail Authority
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
Bay Area	San Francisco Bay Area
BCDC	San Francisco Bay Conservation and Development Commission
BMP	best management practice
BRMP	biological resources management plan
C.F.R.	Code of Federal Regulations
CAAQS	California ambient air quality standards
Cal. Fish and Game Code	California Fish and Game Code
Cal. Public Res. Code	California Public Resources Code
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCC	central California coast
CGP	Construction General Permit
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CMP	compensatory mitigation plan (in biological and aquatic resources discussion)
CMP	construction management plan (in transportation discussion)
CRHR	California Register of Historical Resources
CO	carbon monoxide
CO _{2e}	carbon dioxide equivalent
CPUC	California Public Utilities Commission
CTP	construction transportation plan
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
DDV	Diridon Design Variant
Draft EIR/EIS	<i>San Francisco to San Jose Project Section Draft EIR/EIS</i>
DTX	Downtown Rail Extension
EFH	essential fish habitat
EIR	environmental impact report

Acronym	Definition
EIS	environmental impact statement
ESA	environmentally sensitive area
FESA	federal Endangered Species Act
Final EIR/EIS	<i>San Francisco to San Jose Project Section Final EIR/EIS</i>
FRA	Federal Railroad Administration
GHG	greenhouse gas
HMBP	hazardous materials business plan
HSR	high-speed rail
I-	Interstate
IAMF	impact avoidance and minimization feature
LEDPA	least environmentally damaging practicable alternative
LMF	light maintenance facility
LOS	level of service
MBARD	Monterey Bay Air Resources District
MBTA	Migratory Bird Treaty Act
MMBtu	million British thermal units
MOA	memorandum of agreement
mph	miles per hour
MSASP	Millbrae Station Area Specific Plan
MUNI	San Francisco Municipal Railway
NAAQS	national ambient air quality standards
NCCAB	North Central Coast Air Basin
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NO _x	nitrogen oxides
NRHP	National Register of Historic Places
NZE	near-zero emission
O ₃	ozone
OCS	overhead contact system
O&M	operations and maintenance
PCEP	Peninsula Corridor Electrification Project
PCJPB	Peninsula Corridor Joint Powers Board
PM	particulate matter
PM _{2.5}	particulate matter 2.5 microns or less in diameter
PM ₁₀	particulate matter 10 microns or less in diameter
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
Project Section or project	San Francisco to San Jose Project Section

Acronym	Definition
Prop 1A	Proposition 1A, The Safe, Reliable, High-Speed Passenger Train Bond Act
Revised/Supplemental Draft EIR/EIS	<i>San Francisco to San Jose Project Section: Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement</i>
RHA	Rivers and Harbors Act
RRP	restoration and revegetation plan
RSA	resource study area
RSP Design Variant	Millbrae Station Reduced Site Plan Design Variant
SamTrans	San Mateo County Transit District
SCVHP	Santa Clara Valley Habitat Plan
SFBAAB	San Francisco Bay Area Air Basin
SFO	San Francisco International Airport
SHPO	State Historic Preservation Officer
SIL	significant impact level
SJC	Norman Y. Mineta San Jose International Airport
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLCP	short-lived climate pollutant
SPRR	Southern Pacific Railroad
SR	State Route
STC	Salesforce Transit Center
TCE	temporary construction easement
TPF	traction power facility
TPSS	traction power substation
U.S.C.	United States Code
UPRR	Union Pacific Railroad
US	U.S. Highway
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VdB	vibration decibel
VMT	vehicle miles traveled
VOC	volatile organic compound
VTA	Santa Clara Valley Transportation Authority
WCP	weed control plan
WEAP	worker environmental awareness program
WEF	wildlife exclusion fencing
ZE	zero emission

1 INTRODUCTION

The California Environmental Quality Act (CEQA) Findings of Fact and Statement of Overriding Considerations are intended to fulfill the responsibilities of the California High-Speed Rail Authority (Authority) under CEQA for its approval for the San Francisco to San Jose Project Section (Project Section, or project) of the California High-Speed Rail (HSR) System. CEQA provides that no public agency shall approve a project or program, as proposed, if it would result in significant environmental effects, as identified in an environmental impact report (EIR), unless it adopts and incorporates feasible mitigation to avoid and reduce such effects and adopts appropriate findings.

Section 15091 of the CEQA Guidelines provides as follows:

- a) No public agency shall approve or carry out a project for which an EIR has been certified which identifies one or more significant environmental effects of the project unless the public agency makes one or more written findings for each of those significant effects, accompanied by a brief explanation of the rationale for each finding. The possible findings are:
 - 1) Changes or alterations have been required in, or incorporated into, the project, which avoid or substantially lessen the significant environmental effect as identified in the Final EIR.
 - 2) Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.
 - 3) Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.

CEQA Guidelines Section 15093 further provides:

- a) CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project against its unavoidable environmental risks when determining whether to approve the project. If the specific economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered “acceptable.”

This document includes a description of Alternative A (the Preferred Alternative/CEQA Proposed Project), findings of fact concerning potentially significant environmental impacts and mitigation measures to address such impacts, a discussion of cumulative and growth-inducing impacts, and a Statement of Overriding Considerations.

The custodian of the documents and other materials that constitute the record of proceedings upon which these CEQA Findings of Fact and Statement of Overriding Considerations are based is the Authority, Director of Environmental Services, 770 L Street, Suite 620 MS-1, Sacramento, CA 95814, (916) 324-1541.

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2 PROJECT DESCRIPTION

2.1 Background—Description of Statewide High-Speed Rail System

The Authority, a state governing board formed in 1996, is responsible for planning, designing, constructing, and operating the California High-Speed Rail (HSR) System. Its statutory mandate is to develop an HSR system that coordinates with the state’s existing transportation network, which includes intercity rail and bus lines, regional commuter rail lines, urban rail and bus transit lines, highways, and airports. The California HSR System would provide intercity, high-speed service on more than 800 miles of tracks throughout California, connecting the major population centers of Sacramento, the San Francisco Bay Area (Bay Area), the southern Central Valley, Los Angeles, the Inland Empire, Orange County, and San Diego. The Authority and the Federal Railroad Administration (FRA) prepared two first-tier EIR/environmental impact statement (EIS) documents to select preferred alignments and station locations to advance for more detailed study in second-tier EIRs/EISs. Figure 1 shows the general corridors and station locations of the statewide HSR system that the Authority and FRA selected following the first-tier EIRs/EISs. The California HSR System would use state-of-the-art, electrically powered, high-speed, steel-wheel-on-steel-rail technology, including contemporary safety, signaling, and automatic train control systems, with trains capable of operating up to 220 miles per hour (mph) in HSR project sections that are fully grade separated and on a dedicated track alignment. Following completion of the first-tier programmatic environmental review and decisions, the Authority and FRA divided the statewide HSR system into individual project sections for second-tier environmental review (Authority 2009). One of these sections is the San Francisco to San Jose Project Section.¹

2.1.1 Description of the Preferred Alternative

The portion of the San Francisco to San Jose Project Section Preferred Alternative/CEQA Proposed Project being considered for approval (hereafter, Preferred Alternative) extends 43 miles from 4th and King Street Station in San Francisco to the centerline of Scott Boulevard in Santa Clara. The San Jose Diridon Station (including the portion of the alignment from Scott Boulevard in Santa Clara to West Alma Avenue in San Jose) was approved by the Authority Board of Directors as part of the San Jose to Merced Project Section in April 2022, and accordingly, is not part of this Board action or these findings. As depicted on Figure 2 and described in further detail within the *San Francisco to San Jose Project Section Final Environmental Impact Report/Environmental Impact Statement (Final EIR/EIS)* (Authority 2022a) in Chapter 2, Alternatives, the Preferred Alternative would modify approximately 14.5 miles of existing Caltrain track predominantly within the existing Caltrain right-of-way, construct the East Brisbane light maintenance facility (LMF), modify six existing stations or platforms to accommodate HSR, and install safety improvements and communication radio towers. The Preferred Alternative would modify Caltrain stations for HSR at the 4th and King Street and Millbrae Stations and would include an LMF in Brisbane. Caltrain has several locations of four-track segments where trains can pass; no additional passing tracks would be constructed under the Preferred Alternative. Table 1 summarizes the design features for the Preferred Alternative.

¹ Second-tier planning and environmental review for the HSR system has resulted in some sections being blended with conventional passenger rail, rather than having dedicated track. The San Francisco to San Jose Project Section discussed in these findings is a predominately a two-track blended system using existing Caltrain tracks.

Table 1 Summary of Design Features for the Preferred Alternative

Design Features	Alternative A
Length of existing Caltrain track (miles) ¹	42.9
Length of modified track (miles) ¹	14.5
Length of track modification <1 foot (miles) ¹	5.1
Length of track modification >1 foot and <3 feet (miles) ¹	2.2
Length of track modification >3 feet (miles) ¹	7.2
Length of OCS pole relocation (miles) ^{1, 2}	9.4
Includes additional passing tracks	No
Light maintenance facility	East Brisbane LMF
Modified stations	
Adding HSR to Caltrain stations	4th and King Street, Millbrae
Modifications to Caltrain stations due to the LMF	Bayshore
Modifications to Caltrain stations due to track shifts	San Bruno, Hayward Park
Modifications to Caltrain stations to remove hold-out rule	Broadway
Number of modified or new structures ³	
New structures	14
Modified structures	2
Replaced structures	7
Affected retaining walls	2
Number of at-grade crossings with safety modifications (e.g., four-quadrant gates, median barriers)	38
Length of new perimeter fencing (miles)	7.3
Communication radio towers	20

Sources: Authority 2019a, 2019b

I- = Interstate

LMF = light maintenance facility

OCS = overhead contact system

¹ Lengths shown are guideway mileages, rather than the length of the northbound and southbound track.

² OCS pole relocations are assumed for areas with track shifts greater than 1 foot.

³ Structures include bridges, grade separations such as pedestrian underpasses and overpasses, tunnels, retaining walls, and culverts.

The existing 4th and King Street Station would serve as the interim San Francisco terminal station for the Project Section until the Transbay Joint Powers Authority's Downtown Rail Extension (DTX) Project provides HSR access to the Salesforce Transit Center (STC). Station improvements would include the installation of a booth in the existing station for HSR ticketing and support services, HSR fare gates, and modifications to existing tracks and platforms.

The East Brisbane LMF would be built south of the San Francisco Caltrain tunnels on approximately 100 acres east of the Caltrain corridor. The mainline track would be shifted up to 48 feet, and new yard leads connecting to the East Brisbane LMF would be built west of the existing tracks, then cross over the realigned four-track mainline on an aerial flyover at the north end to avoid blended train operations on the mainline track. Approximately 1,400-foot-long transition tracks would allow trains to reduce or increase speed when entering or exiting the East Brisbane LMF. The track modifications associated with the East Brisbane LMF would require relocating the Bayshore Caltrain Station, demolishing and relocating the Tunnel Avenue overpass, widening the bridge crossing Guadalupe Valley Creek in Brisbane, relocating the Brisbane Fire Station, and relocating control point Geneva. The reconstructed Tunnel Avenue

overpass would connect to Bayshore Boulevard north of its existing connection, at its intersection with Valley Drive.

At the Millbrae Station, new HSR station facilities including a station hall for ticketing and support services would be built on the west side of the existing Caltrain corridor. A new overhead crossing would extend from the station hall to the existing station concourse, providing access to the new HSR tracks and platforms. California Drive would be extended north from Linden Avenue to El Camino Real. Multimodal station access improvements, including curbside pick-up and drop-off areas, would be provided along El Camino Real and the extension of California Drive. Replacement parking for 288 displaced Caltrain and Bay Area Rapid Transit (BART) commuter parking spaces would be located west of the station along El Camino Real, and 37 parking spaces for HSR passengers would be located at the northwest corner of Murchison Drive and California Drive. The historic Southern Pacific Railroad (SPRR) Depot/Millbrae Station (which has previously been relocated to accommodate station improvements) would be relocated to accommodate track modifications.

The Preferred Alternative would continue south from the Millbrae Station in the existing Caltrain corridor, which is predominantly two-track at grade or on retained fill through San Mateo, Belmont, San Carlos, Redwood City, Atherton, Menlo Park, Palo Alto, Mountain View, and Sunnyvale, to Scott Boulevard in Santa Clara. In addition to minor track modifications and the installation of four-quadrant gates and communication radio towers, the Preferred Alternative would modify the platforms at the existing Hayward Park Caltrain Station to accommodate curve straightening.



Figure 1 California High-Speed Rail Statewide System



JUNE 2022

Figure 2 Preferred Alternative for the San Francisco to San Jose Project Section

2.1.2 Impact Avoidance and Minimization Features

The Authority has committed to implementing programmatic impact avoidance and minimization features (IAMF) consistent with the (1) *2005 Statewide Program Environmental Impact Report/ Environmental Impact Statement (EIR/EIS)* (Authority and FRA 2005), (2) *2008 Bay Area to Central Valley Program EIR/EIS* (Authority and FRA 2008), and (3) *2012 Partially Revised Final Program EIR* (Authority 2012a) into the HSR project. The Authority, in consultation with federal and state agencies, has developed a set of standardized IAMFs that it is applying to the statewide HSR system, including the San Francisco to San Jose Project Section. The IAMFs represent practices that are standard or best practices in the construction industry and are incorporated into the project definition. The Authority will implement these IAMFs during project design, construction, operation, and maintenance of the San Francisco to San Jose Project Section.

The Preferred Alternative incorporates IAMFs as identified and discussed in the Final EIR/EIS (Authority 2022a) and described in detail in Appendix 2-E, Project Impact Avoidance and Minimization Features, of the Final EIR/EIS. The Preferred Alternative's compliance with regulatory requirements, including permitting and coordination with regulatory agencies for many project-related activities, provide additional assurance that certain potential adverse environmental impacts will be avoided, or at least minimized.

The applicable regulatory requirements and IAMFs that are part of the Preferred Alternative are described for the following issue areas in more detail in the corresponding chapters of the Final EIR/EIS and are also listed in Table S-3 of the Final EIR/EIS.

- Transportation – Sections 3.2.2 and 3.2.5.2
- Air Quality and Greenhouse Gases – Sections 3.3.2 and 3.3.4.2
- Noise and Vibration – Sections 3.4.2 and 3.4.4.2
- Electromagnetic Fields and Electromagnetic Interference – Sections 3.5.2 and 3.5.4.2
- Public Utilities and Energy – Sections 3.6.2 and 3.6.4.2
- Biological and Aquatic Resources – Sections 3.7.2 and 3.7.6.2
- Hydrology and Water Resources – Sections 3.8.2 and 3.8.4.2
- Geology, Soils, Seismicity, and Paleontological Resources – Sections 3.9.2 and 3.9.4.1
- Hazardous Materials and Waste – Sections 3.10.2 and 3.10.4.2
- Safety and Security – Sections 3.11.2 and 3.11.4.2
- Socioeconomics and Communities – Sections 3.12.2 and 3.12.4.2
- Station Planning, Land Use, and Development – Sections 3.13.2 and 3.13.4.2
- Parks, Recreation, and Open Space – Sections 3.14.2 and 3.14.4.2
- Aesthetics and Visual Quality – Sections 3.15.2 and 3.15.4.2
- Cultural Resources – Sections 3.16.2 and 3.16.5.2
- Regional Growth – Sections 3.17.2 and 3.17.4.2
- Cumulative Impacts – Section 3.18.2

These IAMFs are enforceable components of the Preferred Alternative and are identified in the Mitigation Monitoring and Enforcement Plan (MMEP). Their implementation will be monitored and reported on in conjunction with project monitoring included in the MMEP.

3 FINDINGS REGARDING THE NEED FOR FURTHER RECIRCULATION

Public Resources Code Section 21092.1 and CEQA Guidelines Section 15088.5 provide that a lead agency is required to recirculate an EIR when “significant new information” is added to the EIR after circulation of a Draft EIR for comment, and prior to certification. As used in CEQA Guidelines Section 15088.5, “information” can include changes to a proposed project or its environmental setting as well as the addition of data or other information. Section 15088.5 also provides that new information added to an EIR is not “significant” unless the EIR is changed in a way that deprives the public of a meaningful opportunity to comment upon a substantial adverse environmental effect of the project or a feasible way to mitigate or avoid such an effect that the project’s proponent has declined to implement.

The Authority, on July 23, 2021, announced the availability of a limited revision to its previously published Draft EIR/EIS entitled *San Francisco to San Jose Project Section Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement* (Revised/Supplemental Draft EIR/EIS). The Revised/Supplemental Draft EIR/EIS was made available pursuant to both CEQA and National Environmental Policy Act (NEPA) and presented a new biological resources analysis for monarch butterfly and an analysis of a design variant for the Millbrae Station, neither of which were included in the *San Francisco to San Jose Project Section Draft Environmental Impact Report/Environmental Impact Statement* (Draft EIR/EIS).

The Authority makes the following findings of fact related to the need for further recirculation:

- The Final EIR/EIS includes changes to the proposed project in the form of engineering and design refinements, which were included in the Final EIR/EIS in response to stakeholder comments on the Draft EIR/EIS and to reduce environmental impacts.
- The Final EIR/EIS includes changes to the environmental impacts analysis in Chapters 3 through 5 resulting from the engineering and design refinements, and/or in response to the public comments on the Draft EIR/EIS and Revised/Supplemental Draft EIR/EIS.
- The Final EIR/EIS also includes new and revised mitigation measures in Chapter 3, Affected Environment, Environmental Consequences, and Mitigation Measures, in response to public comments on the Draft EIR/EIS and on the Revised/Supplemental Draft EIR/EIS. The Final EIR/EIS analyzes the secondary effects of these measures and concludes that there would be no new significant impacts resulting from these measures that have not already been evaluated and addressed in other sections of the Final EIR/EIS.
- The new information included in the Final EIR/EIS is adequately and transparently summarized in the Summary and described in more detail in each individual section or chapter of the Final EIR/EIS.
- The engineering and design refinements refine certain features of the alternatives evaluated in the Draft EIR/EIS, but they do not change the fundamental project description of the construction, operation, and maintenance of an electrified high-speed train between San Francisco and San Jose as presented in Chapter 2 of the Draft EIR/EIS.
- Although the Final EIR/EIS includes updates to impact data and calculations, the overall analysis, conclusions, and CEQA significance determinations have not changed and did not result in any new significant environmental impacts or a substantial increase in the severity of an environmental impact from those presented in the Draft EIR/EIS and the Revised/Supplemental Draft EIR/EIS, and therefore, the updates are not “significant” new information within the meaning of CEQA Guidelines Section 15088.5.
- The engineering and design refinements do not result in new significant environmental impacts or a substantial increase in the severity of a previously identified impact.

Based on these facts, the Authority finds that the new information included in the Final EIR/EIS related to the engineering and design refinements, and changes to impact analysis based on the engineering and design refinements and public comments, does not require further recirculation for additional public review and comment.

4 FINDINGS ON SPECIFIC IMPACTS AND MITIGATION MEASURES

The environmental impacts of the Preferred Alternative that would be potentially significant are described in Chapter 3 of Volume 1, Report, of the Final EIR/EIS. These impacts are set forth and summarized in this chapter for the Preferred Alternative, along with mitigation measures the Authority adopts that will avoid or substantially lessen those potentially significant or significant impacts. Due to length of the text, mitigation measures are presented in full separately in Attachment A, Mitigation Monitoring and Enforcement Plan. The impact and mitigation measure findings in this chapter depend upon, and therefore incorporate by reference, the full analysis and conclusions in the Final EIR/EIS.

These findings also set forth those impacts that the Authority finds cannot with certainty be avoided or reduced to a less-than-significant level even with the adoption of all feasible mitigation measures identified in the Final EIR/EIS. In adopting these findings and mitigation measures, the Authority also adopts a Statement of Overriding Considerations. Chapter 8, Statement of Overriding Considerations, describes the economic, social, and other benefits of the Preferred Alternative that would render these significant unavoidable environmental impacts acceptable.

The Authority is not required to make findings or adopt mitigation measures or policies as part of this decision for impacts that are less than significant and require no mitigation or are beneficial.

All resource areas include one or more less-than-significant impact without mitigation or beneficial impacts, as listed below:

- Transportation
- Air Quality and Greenhouse Gases
- Noise and Vibration
- Electromagnetic Fields and Electromagnetic Interference*
- Public Utilities and Energy*
- Biological and Aquatic Resources
- Hydrology and Water Resources
- Geology, Soils, Seismicity, and Paleontological Resources*
- Hazardous Materials and Waste
- Safety and Security
- Socioeconomics and Communities*
- Station Planning, Land Use, and Development
- Parks, Recreation, and Open Space*
- Aesthetics and Visual Quality*
- Cultural Resources
- Regional Growth*

Resource areas for which all impacts in the Final EIR/EIS were identified as less than significant without mitigation measures or beneficial are designated by an asterisk (*) in the list above and are not discussed further in this document. Impacts within a resource area which were identified as less than significant without mitigation measures are also generally not discussed further in this document.

4.1 Transportation (Section 3.2 of the Final EIR/EIS)

Construction of the Preferred Alternative would result in potentially significant temporary impacts on bus transit, passenger rail operations, and freight rail operations and permanent impacts on pedestrian and bicycle access. Operation of the Preferred Alternative would result in continuous permanent impacts on bus services. While most of these potentially significant impacts under the Preferred Alternative would be mitigated to a less-than-significant level, the temporary and permanent impacts on bus transit would remain significant and unavoidable even with implementation of mitigation.

These findings address impacts associated with the Preferred Alternative. Because of length, the full mitigation measure text is presented separately in the MMEP.

4.1.1 Impact TR#8: Temporary Impacts on Bus Transit

Project-related construction staging and traffic for the Preferred Alternative would interfere with bus transit along roadways and at the existing 4th and King Street and Millbrae Stations. The construction of the HSR stations, Brisbane LMF, Caltrain station improvements, at-grade crossing gate improvements, platforms, and track modifications would require temporary construction easements (TCE). The TCEs would require the temporary closure of parking areas, bus stops, or roadway travel lanes. Roadway closures would only occur periodically at night or on weekends, as necessary, which would reduce the potential effect on transit service when it is heaviest during the day on weekdays. Bus stops would be temporarily relocated to nearby locations so that service would not be disrupted. Any closure of roadways, sections of platforms, or transit lines during construction would be temporary.

The contractor will attempt to minimize disruption or shorten the length of time that transit facilities are inoperable and will provide signage to alternate facilities. Upon completion of construction, the contractor will restore parking areas, bus stops, and roadway travel lanes. In accordance with a specific construction management plan (CMP) (TR-IAMF#11) and construction transportation plan (CTP) (TR-IAMF#2), the contractor will attempt to provide temporary bus stops, parking areas, and access with the same features and amenities of the relocated facility, such as lighting, seating, shelters, and signage. To minimize conflicts with transit during construction, the contractor will prepare a specific CMP (TR-IAMF#11) to maintain safe and adequate access for transit users during construction. In addition, the CTP will include methods to minimize construction traffic. A CTP traffic control plan will include provisions to maintain transit flows and access, minimize operations hazards through alternative access and bus route detour provisions, minimize transit schedule disruptions, identify temporary bus stops away from construction locations, and separate transit users from construction locations. Standard construction practices will establish construction truck routes, restrictions on construction hours, and construction vehicle parking (TR-IAMF#3, TR-IAMF#6, TR-IAMF#7).

However, even with these IAMFs, there is a potential for the Preferred Alternative to materially decrease the performance of certain bus transit routes. This impact is significant under CEQA (Authority 2022a: page 3.2-82).

The Authority finds that there are no feasible mitigation measures or alternatives that could be adopted to reduce the impact of construction on bus transit to less-than-significant levels.² The Authority finds that despite this otherwise significant and unavoidable impact, specific economic, social, and other considerations identified in the Statement of Overriding Considerations (Chapter 8 of this document) support certification of the Final EIR/EIS and approval of the project.

4.1.2 Impact TR#10: Temporary Impacts on Passenger Rail Operations

Project-related construction, staging, and traffic would contribute to temporary interference with passenger rail transit. The construction of the HSR stations, platforms, and track alignment would require TCEs. The TCE may require the temporary closure of transit stations, passenger rail platforms, and passenger rail track for other operators where the systems interface. Any closure of passenger rail stations, platforms, and track during construction would be temporary (on the scale of hours or days). Where passenger rail stations are closed, temporary stations would be established to avoid cessation of service at that station.

² A mitigation measure (TR-MM#2: Install Transit Signal Priority Treatments) is applicable to impacts of Alternative A within the San Jose Diridon Station Approach Subsection. This mitigation measure is included for Impact TR#8 in the Final EIR/EIS but is not included in these findings because the San Jose Diridon Station Approach Subsection was approved by the Authority Board of Directors as part of the San Jose to Merced Project Section in April 2022.

The contractor will to degree feasible minimize disruption to passenger rail facilities or shorten the length of time that these facilities would be inoperable (TR-IAMF#2). Where feasible, the contractor will schedule cessation of passenger rail service during the night or on weekends to minimize disruption of passenger rail service. To minimize conflicts with passenger rail transit caused by construction, the contractor will repair any damaged sections to the equivalent of their original structural condition or better and the use of existing alternative tracks where available (TR-IAMF#9). If necessary and feasible, a shoofly track may be built to allow existing train lines to bypass areas closed for construction activities. Upon completion, HSR contractors will open and repair tracks or build a new mainline track and remove the shoofly track.

The contractor will identify specific measures in the CMP (TR-IAMF#11) to maintain transit access and safe and adequate access for transit users during construction activities. In addition, the CTP will include methods to minimize construction traffic (TR-IAMF#2). A traffic control plan developed as part of the CTP will include provisions for maintaining traffic flow and access and minimizing operations hazards through alternative access and detour provisions, routes for construction traffic, and scheduled transit access. The contractor will establish construction truck routes, restrictions on construction hours, and construction parking as part of the CTP. While the CMP will control passenger rail operations and minimize disruption, there would still be residual disruptions to passenger rail operation at times.

However, even with these IAMFs, there is a potential for the Preferred Alternative to result in the temporary disruption of passenger rail operations. This impact is significant under CEQA (Authority 2022a: page 3.2-85).

The following measure mitigates this impact: TR-MM#3: Implement Railway Disruption Control Plan.

The Authority will implement mitigation measures to reduce temporary impacts on passenger rail operations. TR-MM#3 will minimize the duration of construction in areas that would require temporary closures, limit construction hours, and plan for coordination between the construction contractor and passenger rail service providers so that disruptions will be limited to a maximum of several hours or several days. The goal of the railway disruption control plan will be to minimize the overall duration of disruption of passenger and freight operations and maintain reasonable levels of service (LOS), while allowing expeditious completion of construction. The construction contractor will coordinate with Caltrain and with Union Pacific Railroad (UPRR) in advance and during any potential disruption to passenger or freight operations or Caltrain or UPRR facilities. The construction contractor will maintain passenger rail and UPRR's emergency access throughout construction. The Authority will require consultation with respect to coordination between the Authority and freight operators and shippers. These provisions include the establishment of a freight stakeholder committee with quarterly coordination meetings throughout the construction duration; consultation with Caltrain, UPRR, and freight operators and shippers during preparation of the construction disruption plan, including provision of a draft plan for review and comment prior to finalization; and notification of planned closures at least 3 months in advance.

This mitigation measure will be effective in minimizing the temporary disruption of passenger rail operations.

The Authority finds that TR-MM#3 is required under the Preferred Alternative and that this mitigation measure will reduce impacts on passenger rail to a less-than-significant level.

4.1.3 Impact TR#11: Continuous Permanent Impacts on Bus Services

Vehicle trips around the stations would increase when the project becomes fully operational because of the addition of HSR passengers and workers traveling to and from station areas. Many of these trips would occur during peak hours. This added traffic would lead to increased volumes, congestion, and delays around the 4th and King Street Station and Millbrae Station. In addition, the increased gate-down time at at-grade crossings from added HSR trains would result in increased congestion and delays at the at-grade rail crossings and adjacent intersections.

The increased congestion and delay would occur along high-frequency San Francisco Municipal Railway (MUNI) and San Mateo County Transit District (SamTrans) bus routes (i.e., routes with service every 15 minutes or less), contributing to bus performance delay. The addition of project-related vehicle trips would affect bus on-time performance and operating speeds. The Preferred Alternative would add project-related trips affecting seven high-frequency bus routes near the 4th and King Street Station and the Millbrae Station. It would also add gate-down time, further affecting one high-frequency bus route in the San Francisco to South San Francisco Subsection and one high-frequency bus route in the San Mateo to Palo Alto Subsection.

The Preferred Alternative would have a permanent impact on bus transit. This impact is significant under CEQA (Authority 2022a: page 3.2-88).

The following measure mitigates this impact for the one high-frequency route affected near the Millbrae Station and the one high-frequency route affected in the San Mateo to Palo Alto Subsection: TR-MM#2: Install Transit Priority Treatments.

The Authority will implement TR-MM#2 to reduce permanent impacts on bus services. TR-MM#2 will improve bus transit operations in the 4th and King Street Station and the Millbrae Station areas as well as in the San Mateo to Palo Alto Subsection by installing transit priority treatments that prioritize bus transit in the following key locations:

- 4th and King Street Station Area
 - Fifth Street and Townsend Street along MUNI Routes 30 and 45
- Millbrae Station Area
 - El Camino Real between Hillcrest Boulevard and Trousdale Drive
- San Mateo to Palo Alto Subsection
 - Ravenswood Avenue between El Camino Real and Middlefield Road
 - Middlefield Road between Marsh Road and Willow Road

This mitigation measure will be effective in improving the speed and reliability of bus routes affected by project-related trips by identifying targeted improvements to enhance operations for the one high-frequency route affected near the Millbrae Station and the one high-frequency route affected in the San Mateo to Palo Alto Subsection.

The Authority finds that TR-MM-#2 is required under the Preferred Alternative and that it will lessen the project's impact on bus services; however, the CEQA impact would remain significant and unavoidable. The Authority finds that there are no other feasible mitigation measures or alternatives that could be adopted to reduce this remaining impact to less-than-significant levels for the two affected high-frequency bus routes near the 4th and King Street Station and the one affected high-frequency bus route at an at-grade crossing in the San Francisco to South San Francisco Subsection. MUNI Routes 30 and 45 would be affected by increased congestion around the 4th and King Street Station, and while the transit priority treatments in TR-MM#2 will improve conditions, they will not reduce transit delays to a less-than-significant level and no additional feasible mitigations are available. MUNI Route 55 would also be affected by increased gate-down time at the 16th Street at-grade-crossing, but MUNI already plans to implement bus transit signal priority for 16th Street, and no other feasible mitigations are available to address impacts on MUNI Route 55. The Authority finds that despite this otherwise significant and unavoidable impact, specific economic, social, and other considerations identified in the Statement of Overriding Considerations (Chapter 8) support certification of the Final EIR/EIS and approval of the project.

4.1.4 Impact TR#17: Continuous Permanent Impacts on Pedestrian and Bicycle Access

Pedestrian and bicycle trips around the stations would increase when the project becomes fully operational because of the addition of HSR passengers and workers traveling to and from station

areas. This added traffic would lead to increased pedestrian volumes in an already congested pedestrian environment around the 4th and King Street Station. The increase in pedestrian traffic caused by the project would exacerbate pedestrian crowding concerns around limited sidewalk capacity along the Fourth Street station frontage between Townsend Street and King Street.

The Preferred Alternative would have a permanent impact on pedestrian access at the 4th and King Street Station. This impact is significant under CEQA (Authority 2022a: page 3.2-97).

The following measure mitigates this impact: TR-MM#5: Contribute to 4th and King Street Station Pedestrian Improvements.

The Authority will implement TR-MM#5 to reduce permanent impacts on pedestrian and bicycle access. TR-MM#5 will increase sidewalk capacity on Fourth Street along the station frontage between Townsend Street and King Street through a collaborative development of an improvement plan with Caltrain and the City and County of San Francisco, and the subsequent construction of pedestrian improvements based on the approved pedestrian improvement plan. This mitigation measure will be effective in reducing pedestrian impacts associated with new pedestrian trips generated by HSR at the 4th and King Street Station while it serves as the interim northern terminus station prior to completion of the DTX project and subsequent extension of rail service to the STC.

The Authority finds that TR-MM#5 is required under the Preferred Alternative and that this mitigation measure will reduce permanent impacts on pedestrian access to a less-than-significant level.

4.1.5 Impact TR#18: Temporary Impacts on Freight Rail Operations

The construction of the HSR stations, platforms, and track modifications would require construction in certain areas presently used for freight service. Construction would require the temporary closure of tracks presently used by freight in certain areas for limited durations. With the exception of work related to the Brisbane flyover, freight rail would be able to have at least single track access, except during limited periods when connecting new/realigned tracks to existing tracks. Any closure or removal of freight track during construction associated with track connections would be temporary (ranging from a few hours to a few days), but would disrupt freight rail operations. This would result in inconvenience to freight operators and customers and could result in additional truck traffic if necessary to meet freight delivery requirements.

The project contractor will repair any structural damage to freight or public railways that may occur during the construction period and return any damaged sections to their original structural condition (TR-IAMF#9). If there is room within the existing Caltrain right-of-way and if it is necessary during construction, a shoofly track will be built to allow existing train lines to bypass any areas closed for construction activities where feasible. Upon completion, tracks will be opened and repaired or new mainline track will be built, and the temporary shoofly track will be removed. Shoofly tracks are only feasible in areas with unconstrained right-of-way with adequate space and may not be feasible in constrained areas.

Where shoofly tracks are not feasible, there could be temporary delays on the order of hours or at most a few days, and the closures would usually occur at nights and on weekends and holidays to minimize disruption. However, the Authority and the freight railroads would work together to build the project in a manner consistent with the agreements negotiated by the Authority's contractor during the final design process. This would enable each entity to conduct its relevant activities in a manner that would reduce impacts on freight railroad operations.

However, even with this IAMF, there is a potential for the Preferred Alternative to affect freight rail operations. This impact is significant under CEQA (Authority 2022a: page 3.2-105).

The following measure mitigates this impact: TR-MM#3.

The Authority will implement TR-MM#3 to reduce temporary impacts on freight rail operations. TR-MM#3 will minimize the duration of construction in areas that would require temporary closures, limit construction hours, and plan for coordination between the construction contractor

and passenger rail service providers so that disruptions will be limited to a maximum of several hours or several days. The goal of the railway disruption control plan will be to minimize the overall duration of disruption of passenger and freight operations and maintain reasonable LOS, while allowing expeditious completion of construction. The construction contractor will coordinate UPRR, freight operators, and freighter users in advance and during any potential disruption to freight operations or facilities. The construction contractor will maintain freight rail access throughout construction with the exception of the limited closures noted in the Final EIR/EIS.

This mitigation measure will be effective in minimizing the disruption of passenger rail operations.

The Authority finds that TR-MM#3 is required under the Preferred Alternative and that this mitigation measure will reduce impacts on freight rail operations to a less-than-significant level.

4.2 Air Quality and Greenhouse Gases (Section 3.3 of the Final EIR/EIS)

Construction of the Preferred Alternative would result in potentially significant temporary impacts on air quality within the San Francisco Bay Area Air Basin (SFBAAB), on implementation of an applicable air quality plan, and on localized air quality within the SFBAAB. While most of these potentially significant impacts under the Preferred Alternative would be mitigated to a less-than-significant level, impacts on localized air quality within the SFBAAB would remain significant and unavoidable even with mitigation.

These findings address impacts associated with the Preferred Alternative. Because of length, the full mitigation measure text is presented separately in the MMEP.

4.2.1 Impact AQ#1: Temporary Direct and Indirect Impacts on Air Quality within the SFBAAB

The predominant pollutants associated with project construction are fugitive dust (particulate matter 10 microns or less in diameter [PM_{10}] and particulate matter 2.5 microns or less in diameter [$PM_{2.5}$]) from earthmoving activities and combustion pollutants, particularly ozone (O_3) precursors (nitrogen oxides [NO_x] and volatile organic compounds [VOC]) and carbon monoxide (CO) from heavy equipment and trucks. VOCs would also be generated from paints and other coatings used during construction activities. Final EIR/EIS Table 3.3-12 presents construction emissions from the Preferred Alternative in the SFBAAB in tons per year and pounds per day.³ The table reflects the impact of the Safer Affordable Fuel-Efficient Vehicles Rule (California Air Resources Board [CARB] 2019).

The following IAMFs are incorporated in the Preferred Alternative:

- AQ-IAMF#1 will minimize fugitive dust emissions through a dust control plan. The fugitive dust control plan will outline measures such as washing vehicles before exiting the construction site, watering unpaved surfaces, limiting vehicle travel speed, and suspending dust-generating activities during high wind events.
- AQ-IAMF#2 will minimize off-gassing emissions of VOCs that would occur from paints and other coatings by requiring the use of low-VOC paint and super-compliant or Clean Air paint that has a lower VOC content than that required by Bay Area Air Quality Management District (BAAQMD) rules.
- AQ-IAMF#3 will minimize exhaust emissions from off-road equipment with renewable diesel fuel. Renewable diesel is produced from non-petroleum renewable resources and waste

³ The construction-related criteria pollutant emissions in the SFBAAB presented in Table 3.3-12 include those within the San Jose Diridon Station Approach Subsection, which was approved by the Authority Board of Directors as part of the San Jose to Merced Project Section in April 2022. Accordingly, for the Preferred Alternative to Scott Boulevard, the criteria pollutant emissions in the SFBAAB would be less than disclosed in Table 3.3-12.

products and generates substantially fewer emissions than traditional diesel per gallon combusted.

- AQ-IAMF#4 will minimize exhaust emissions from off-road equipment by requiring all heavy-duty equipment used during the construction phase to meet Tier 4 engine requirements. Tier 4 engine requirements are currently the strictest emissions standards adopted by the CARB and U.S. Environmental Protection Agency (USEPA).
- AQ-IAMF#5 will minimize exhaust emissions from on-road trucks by requiring all trucks used to haul construction materials to operate a model year 2010 engine or newer.
- AQ-IAMF#6 will minimize fugitive dust emissions from concrete batch plants through typical control measures, such as water sprays, enclosures, hoods, and other suitable technology.

However, even with incorporation of these IAMFs, the project would result in a temporary impact on regional air quality during construction because increased NO_x emissions would exceed BAAQMD’s CEQA thresholds. This impact is significant under CEQA (Authority 2022a: page 3.3-58).

The following measures mitigate this impact: AQ-MM#1: Construction Emissions Reductions—Requirements for use of Zero Emission and/or Near Zero Emission Vehicles and Off-Road Equipment; and AQ-MM#2: Offset Project Construction Emissions in the SFBAAB.

The Authority will implement mitigation measures to reduce temporary direct and indirect effects on air quality within the SFBAAB. AQ-MM#1 requires that a minimum of 25 percent of all light-duty on-road vehicles use zero-emission (ZE) or near-zero-emission (NZE) technology. The measure also includes ZE and NZE goals for heavy-duty on-road trucks and off-road equipment. This mitigation measure will reduce the impact of construction emissions from project-related on-road vehicles and off-road equipment.

AQ-MM#2 requires that prior to issuance of construction contracts, the Authority enter into an agreement with BAAQMD to offset remaining NO_x emissions to below BAAQMD’s CEQA threshold levels. This mitigation measure will be effective in offsetting emissions generated during project construction through the funding of emission-reduction projects. Offsets will be consistent with BAAQMD protocol and requirements and their effectiveness will be verified by BAAQMD. It is BAAQMD’s experience that emissions offsets are feasible mitigation that effectively achieve actual emission reductions. The Authority has executed similar memorandums of understanding with other air districts to offset emissions for other project sections and this has proven to be effective mitigation to reduce impacts below the threshold of significance.

These mitigation measures will be effective in minimizing temporary direct and indirect impacts on air quality within the SFBAAB during construction.

The Authority finds that AQ-MM#1 and AQ-MM#2 are required under the Preferred Alternative and that these mitigation measures will reduce impacts on regional air quality in the SFBAAB to a less-than-significant level.

4.2.2 Impact AQ#4: Temporary Direct Impacts on Implementation of an Applicable Air Quality Plan

Emissions from construction of the Preferred Alternative would be temporary, occurring for approximately 6 years from 2021 through 2026. Emissions from project construction in the North Central Coast Air Basin (NCCAB) and San Joaquin Valley Air Basin (SJVAB) would be temporary, occurring for approximately 2 years from 2022 through 2023. Once construction is complete, air quality in the SFBAAB, NCCAB, and SJVAB is expected to improve. However, during the construction period, construction activities could cause air quality impacts that exceed BAAQMD thresholds and federal General Conformity thresholds, which support implementation of air quality plans.

The BAAQMD, Monterey Bay Air Resources District (MBARD), and San Joaquin Valley Air Pollution Control District (SJVAPCD) have also developed project-level thresholds. These

thresholds prevent new projects from contributing to California ambient air quality standards (CAAQS) or national ambient air quality standards (NAAQS) violations, which supports implementation of regional air quality plans to attain NAAQS and CAAQS. Construction emissions from the Preferred Alternative would exceed the BAAQMD's CEQA thresholds for NO_x. Construction emissions would not exceed the MBARD or SJVAPCD thresholds for any criteria pollutant. Exceedances of adopted thresholds could conflict with applicable air quality plans.

The Preferred Alternative incorporates stringent on-site emissions controls, including fugitive dust control practices (AQ-IAMF#1), use of low-VOC paints (AQ-IAMF#2), use of renewable diesel (AQ-IAMF#3), use of Tier 4 off-road engines (AQ-IAMF#4), and use of model year 2010 or newer on-road engines (AQ-IAMF#5). However, even with these IAMFs, exceedances of adopted thresholds would still occur and would be considered a significant impact under CEQA (Authority 2022a: page 3.3-58).

The following measures mitigate this impact: AQ-MM#1 and AQ-MM#2.

The Authority will implement mitigation measures to reduce temporary direct impacts on applicable air quality plan. AQ-MM#1 will reduce on-site emissions from project-related on-road vehicles and off-road equipment. AQ-MM#2 requires the offset of remaining NO_x emissions to below BAAQMD's CEQA thresholds. Because BAAQMD's thresholds were established to prevent emissions from new projects in the SFBAAB from contributing to CAAQS or NAAQS violations, offsetting emissions below the threshold levels will avoid potential conflicts with the ambient air quality plans and project construction will not contribute a significant level of air pollution such that regional air quality within the SFBAAB will be degraded.

These mitigation measures will be effective in minimizing the project's impact on applicable air quality plans.

The Authority finds that AQ-MM#1 and AQ-MM#2 are required under the Preferred Alternative and that these mitigation measures will reduce impacts on applicable air quality plans to a less-than-significant level.

4.2.3 Impact AQ#5: Temporary Direct Impacts on Localized Air Quality in the SFBAAB—Criteria Pollutants

Construction of the Preferred Alternative would lead to localized concentrations that would exceed the 24-hour PM₁₀ CAAQS and significant impact level (SIL), indicating that the Preferred Alternative would contribute to existing exceedances of the CAAQS for PM₁₀ where background concentrations already exceed the CAAQS.

AQ-IAMF#1 through AQ-IAMF#6 minimize construction emissions and air quality impacts through the best available on-site controls. These best available on-site controls include fugitive dust control practices (AQ-IAMF#1), use of low-VOC paints (AQ-IAMF#2), use of renewable diesel (AQ-IAMF#3), use of Tier 4 off-road engines (AQ-IAMF#4), use of model year 2010 or newer on-road engines (AQ-IAMF#5), and reduction of emissions from concrete batch plants (AQ-IAMF#6). However, even with these IAMFs, exceedances of the CAAQS would still occur, which would be considered a significant impact under CEQA (Authority 2022a: page 3.3-83).

The following measure would lessen these impacts: AQ-MM#1: Construction Emissions Reductions – Requirements for Use of Zero Emission and/or Near Zero Emission Vehicles and Off-Road Equipment. AQ-MM#1 is a commitment to prioritize the use of electric-powered equipment and vehicles as they become available.

The Authority will implement the mitigation measure to reduce temporary direct impacts on localized air quality in the SFBAAB for criteria pollutants. AQ-MM#1 will reduce on-site emissions from project-related on-road vehicles and off-road equipment.

The Authority finds that AQ-MM#1 is required under the Preferred Alternative and that it will lessen the project's impact on localized air quality during construction; however, the CEQA impact would remain significant and unavoidable. The Authority finds that there are no other feasible mitigation measures or alternatives that could be adopted to reduce this remaining

impact to less-than-significant levels. Use of electrical-powered equipment is limited by lack of availability (i.e., contractor cannot secure an electric model within 200 miles of the construction site), limited commercialization (i.e., electric models have not been developed), or prohibitive costs (i.e., electric models are more than 100 percent the cost of diesel counterparts). The Authority finds that despite this otherwise significant and unavoidable impact, specific economic, social, and other considerations identified in the Statement of Overriding Considerations (Chapter 8) support certification of the Final EIR/EIS and approval of the project.

4.3 Noise and Vibration (Section 3.4 of the Final EIR/EIS)

The Preferred Alternative would result in potentially significant impacts related to temporary exposure of sensitive receptors to construction noise. In addition, the Preferred Alternative would result in intermittent permanent exposure of sensitive receptors to noise from train operations, and permanent exposure of sensitive receptors to vehicular traffic noise increases and traction power facility (TPF) noise. The Preferred Alternative would also result in potentially significant impacts related to temporary exposure of sensitive receptors and buildings to construction vibration and intermittent permanent exposure of sensitive receptors to vibration from operations.

The potentially significant impact from permanent exposure of sensitive receptors to TPF noise and temporary exposure of sensitive receptors and buildings to construction vibration would be mitigated to less than significant. However, the potentially significant impact from temporary exposure of sensitive receptors to construction noise, intermittent permanent exposure of sensitive receptors to noise from train operations, permanent exposure of sensitive receptors to vehicular traffic noise increases, and intermittent permanent exposure of sensitive receptors to vibration from operations would remain significant and unavoidable even with mitigation.

These findings address impacts associated with the Preferred Alternative. Because of length, the full mitigation measure text is presented separately in the MMEP.

As explained in the Final EIR/EIS, noise barriers under MM-NV#3, could have secondary impacts on visual aesthetics and require tree or vegetation removal. Depending on their design, height, and location, noise barriers can become visually intrusive, blocking views or creating places for unwanted graffiti. Noise barriers will be installed within the fenced areas of the existing Caltrain right-of-way, which is often shielded from view by fencing or landscaping (described in Section 3.15, Aesthetics and Visual Quality of the Final EIR/EIS). In accordance with AVQ-MM#6: Provide Noise Barrier Treatment, as part of the final design and construction management plan, the Authority will work with local jurisdictions to develop the appropriate noise barrier style and treatments for visually sensitive areas, to reduce the visual effect of barriers on adjacent land uses.

4.3.1 Impact NV#1: Temporary Exposure of Sensitive Receptors to Construction Noise

Construction activities associated with the Preferred Alternative would affect sensitive receptors by temporarily and periodically substantially increasing ambient noise levels in the project vicinity in exceedance of FRA noise impact criteria. Temporary noise impacts would result from activities associated with construction, modification, and relocation of existing tracks, stations, and platforms; modification of existing roadways and structures; construction of the Brisbane LMF; installation of four-quadrant gates at at-grade crossings and perimeter fencing at the edge of the right-of-way; utility relocation; site preparation including demolition, excavation, and grading; and installation of systems components. The Preferred Alternative incorporates NV-IAMF#1 to minimize noise impacts by requiring compliance with FRA and Federal Transit Administration guidelines for minimizing construction noise and vibration impacts when work is conducted within 1,000 feet of sensitive receptors. However, even with NV-IAMF#1, some sensitive receptors would be exposed to construction noise that exceeds FRA noise impact criteria. This is considered a significant impact under CEQA (Authority 2022a: page 3.4-48).

The following measure mitigates this impact: NV-MM#1: Construction Noise Mitigation Measures.

The Authority will implement NV-MM#1 to reduce the potential for construction noise impacts. This mitigation measure requires the contractor to prepare a noise monitoring program prior to construction to meet the construction noise limits wherever feasible. The monitoring program will describe the actions the contractor will use to reduce noise, such as installing temporary noise barriers, avoiding nighttime construction near residential areas, using low-noise emission equipment, and other actions as necessary and feasible. This mitigation measure will reduce construction noise levels but not always below the FRA noise impact criteria, particularly at night and during pile driving.

The Authority finds that NV-MM#1 is required under the Preferred Alternative and that it will lessen the project's construction noise impact; however, the CEQA impact would remain significant and unavoidable. The Authority finds that there are no other feasible mitigation measures or alternatives that could be adopted to reduce this remaining impact to less-than-significant levels. The Authority finds that despite this otherwise significant and unavoidable impact, specific economic, social, and other considerations identified in the Statement of Overriding Considerations (Chapter 8) support certification of the Final EIR/EIS and approval of the project.

4.3.2 Impact NV#2: Intermittent Permanent Exposure of Sensitive Receptors to Noise from Operations

Operations of the Preferred Alternative would increase train services in the Caltrain corridor between stations and to and from the Brisbane LMF and would increase the frequency of train horn sounding at at-grade crossings and Caltrain passenger station platforms, which would result in increases in noise levels. Operations of the Preferred Alternative would increase noise levels above existing ambient levels and in exceedance of FRA criteria, causing severe noise impacts at sensitive receptors. The Preferred Alternative would result in 1,634 severe noise impacts prior to mitigation, as shown in Final EIR/EIS Table 3.4-16.⁴ This is considered a significant impact under CEQA (Authority 2022a: page 3.4-62). Some of these impacts may be reduced with mitigation.

The following measures mitigate this impact: NV-MM#3: Implement Proposed California High-Speed Rail Project Noise Mitigation Guidelines; NV-MM#4: Support Potential Implementation of Quiet Zones by Local Jurisdictions; NV-MM#5: Vehicle Noise Specification; NV-MM#6: Special Trackwork at Crossovers, Turnouts, and Insulated Joints; and NV-MM#7: Additional Noise Analysis during Final Design.

The Authority will implement mitigation measures to reduce noise impacts at sensitive receptors from operations. As part of NV-MM#3, the Authority will consider constructing noise barriers, installing sound insulation, or acquiring easements on properties severely affected by noise, based on criteria in the Authority's Noise and Vibration Mitigation Guidelines (Authority 2022a: Appendix 3.4-B). As part of NV-MM#4, the Authority will assist local communities in establishing quiet zones to reduce noise impacts from train warning horns where cities decide to implement them. NV-MM#5 requires HSR vehicles to meet federal regulations for noise (40 Code of Federal Regulations [C.F.R.] § 201.12) at the time of procurement. NV-MM#6 requires the contractor to document how they minimized or eliminated rail gaps related to special trackwork, which can be a major source of noise during operations. As part of NV-MM#7, if any changes to final design or vehicle specifications change any assumptions underlying the noise analysis, the Authority will prepare the necessary environmental documentation as required by CEQA to reassess potential impacts and mitigation.

These mitigation measures will be effective at reducing the number of severe noise impacts in the resource study area (RSA); however, they will not mitigate all noise impacts because noise

⁴ The noise impacts in Table 3.4-16 include those within the San Jose Diridon Station Approach Subsection, which was approved by the Authority Board of Directors as part of the San Jose to Merced Project Section in April 2022. Accordingly, for the portion of the Preferred Alternative to Scott Boulevard, the impacts would be less than disclosed in Table 3.4-16.

barriers are not cost-effective or acoustically feasible in all areas with predicted noise impacts. Table 3.4-27 of the Final EIR/EIS summarizes the residual noise impacts with noise barriers alone, and with a combination of noise barriers and quiet zones.⁵ As specified in the noise mitigation guidelines (Authority 2022a: Appendix 3.4-B), noise barriers should be approved by 75 percent of affected parties in a community; if they do not approve, then noise barriers may not be installed at certain locations. Quiet zones cannot be implemented by the Authority or any rail operators (like the California Department of Transportation [Caltrans]); they can only be established at the initiative of a local jurisdiction. Thus, quiet zones may not be adopted where local jurisdictions do not want them to be established.

Because severe noise impacts would remain following mitigation and/or noise barriers or quiet zones would not be implemented due to the constraints noted above, the impact would be significant and unavoidable under CEQA.

The Authority finds that NV-MM#3, NV-MM#4, NV-MM#5, NV-MM#6, and NV-MM#7 are required under the Preferred Alternative and that they will lessen the project's operational noise impacts; however, the CEQA impact would remain significant and unavoidable. The Authority finds that there are no other feasible mitigation measures or alternatives that could be adopted to reduce this remaining impact to less-than-significant levels. The Authority finds that despite this otherwise significant and unavoidable impact, specific economic, social, and other considerations identified in the Statement of Overriding Considerations (Chapter 8) support certification of the Final EIR/EIS and approval of the project.

4.3.3 Impact NV#6: Permanent Exposure of Sensitive Receptors to Vehicular Traffic Noise Increases

Two roadway segments would have the potential for noise level increases greater than or equal to 3 decibels (dB) compared to existing noise conditions in 2029 under the Preferred Alternative. By 2040, four roadway segments would have the potential for noise level increases greater than or equal to 3 A-weighted decibels (dBA). This is considered a significant impact under CEQA (Authority 2022a: page 3.4-65).

The following measures mitigate this impact: NV-MM#3 and NV-MM#7.

The Authority will implement mitigation measures to reduce the noise impacts from vehicular traffic noise. Under NV-MM#3, the Authority will investigate the traffic noise impacts and ways to mitigate them by means such as noise barriers. Pursuant to NV-MM#7, if any changes to final design or vehicle specifications change any assumptions underlying the noise analysis, the Authority will prepare the necessary environmental documentation as required by CEQA to reassess impacts and mitigation.

The Authority finds that NV-MM#3 and NV-MM#7 are required under the Preferred Alternative and that they will lessen the project's vehicular traffic noise impacts; however, the CEQA impact would remain significant and unavoidable. The Authority finds that there are no other feasible mitigation measures or alternatives that could be adopted to reduce this remaining impact to less-than-significant levels. The Authority finds that despite this otherwise significant and unavoidable impact, specific economic, social, and other considerations identified in the Statement of Overriding Considerations (Chapter 8) support certification of the Final EIR/EIS and approval of the project.

4.3.4 Impact NV#7: Traction Power Facility Noise

Project operations under the Preferred Alternative would permanently expose sensitive receptors to severe noise increase from PS5 Option 2 in Palo Alto. One residential building would be

⁵ The residual noise impacts in Table 3.4-27 include those within the San Jose Diridon Station Approach Subsection, which was approved by the Authority Board of Directors as part of the San Jose to Merced Project Section in April 2022. Accordingly, for the Preferred Alternative to Scott Boulevard, the residual impacts would be less than disclosed in Table 3.4-27.

exposed to a noise increase that exceeds the 3-dB severe impact threshold for the TPF and the HSR trains. This is considered a significant impact under CEQA (Authority 2022a: page 3.4-66).

The following measures mitigate this impact: NV-MM#3 and NV-MM#7.

The Authority will implement mitigation measures to reduce the noise impacts from TPF. As part of NV-MM#3, the Authority will investigate the TPF noise impacts and implement mitigation such as installation of noise barriers around the facility. As part of NV-MM#7, additional design considerations such as equipment selection and siting will be evaluated during final design if needed to mitigate the noise. These mitigation measures, including noise barrier mitigation, will mitigate all severe noise impacts from the TPF.

These mitigation measures will be effective in minimizing the project's TPF severe noise impacts.

The Authority finds that NV-MM#3 and NV-MM#7 are required under the Preferred Alternative and that these mitigation measures will reduce impacts on exposure of sensitive receptors to TPF noise to a less-than-significant level.

4.3.5 Impact NV#8: Temporary Exposure of Sensitive Receptors and Buildings to Construction Vibration

Construction activities would expose persons and could expose buildings to excessive ground-borne vibration from pile driving for the LMF foundation and foundations for bridge structures, and possibly other construction activities such as vibratory compaction and demolition. NV-IAMF#1 minimizes construction vibration and its potential to cause damage to buildings and human annoyance. However, even with NV-IAMF#1, some sensitive receptors would be exposed to ground-borne vibration that would result in annoyance, and buildings could be exposed to vibration that exceeds the FRA vibration damage criteria. This is considered a significant impact under CEQA (Authority 2022a: page 3.4-69).

The following measure mitigates this impact: NV-MM#2: Construction Vibration Mitigation Measures.

The Authority will implement NV-MM#2 to minimize vibration impacts from construction. As part of this mitigation measure, the contractor will develop and implement vibration reduction methods when impact pile driving or other high-vibration-producing activity would occur within 55 feet of any building to meet FRA vibration impact criteria. Prior to starting pile driving and other high-vibration activity, the contractor will conduct pre-construction surveys within 55 feet of the activity to document the existing condition of buildings in case damage is reported during or after construction. The contractor will arrange for the repair of damaged buildings or will pay compensation to the property owner.

This mitigation measure will be effective in minimizing the project's temporary construction vibration impacts.

The Authority finds that NV-MM#2 is required under the Preferred Alternative and that this mitigation measure will reduce the project's temporary construction vibration impacts to a less-than-significant level.

4.3.6 Impact NV#9: Intermittent Permanent Exposure of Sensitive Receptors to Vibration from Operations

Operation of the Preferred Alternative would generate excessive ground-borne vibration impacts at sensitive receptors in all five subsections. The Preferred Alternative would result in 2,290 vibration impacts as well as 18 ground-borne noise impacts. This is considered a significant impact under CEQA (Authority 2022a: page 3.4-83).

The following measure mitigates this impact: NV-MM#8: Project Vibration Mitigation Measures.

The Authority will implement NV-MM#8 to minimize vibration impacts from operations. While the precise evaluation of the effectiveness of NV-MM#8 requires detailed designs and consideration

of site-specific conditions, vibration mitigation has the potential to reduce the vibration levels by up to 10 dB.

The Authority finds that NV-MM#8 is required under the Preferred Alternative and that it will lessen the project's operational vibration impacts; however, the CEQA impact would remain significant and unavoidable. The Authority finds that there are no other feasible mitigation measures or alternatives that could be adopted to reduce this remaining impact to less-than-significant levels. The Authority finds that despite this otherwise significant and unavoidable impact, specific economic, social, and other considerations identified in the Statement of Overriding Considerations (Chapter 8) support certification of the Final EIR/EIS and approval of the project.

4.4 Biological and Aquatic Resources (Section 3.7 of the Final EIR/EIS)

The Preferred Alternative would result in potentially significant impacts on special-status plant habitat and special-status plant communities; permanent conversion or degradation of habitat for and mortality of multiple wildlife, bird, and fish species; permanent conversion or degradation of aquatic resources; and removal or mortality of protected trees.⁶ All potentially significant impacts would be mitigated to less than significant with mitigation measures.

These findings address impacts associated with the Preferred Alternative. Because of length, the full mitigation measure text is presented separately in the MMEP. As explained in the Final EIR/EIS, mitigation measures requiring compensatory mitigation could potentially result in secondary effects related to air quality and cultural resources. Any potential secondary effects are speculative and cannot be quantified. Construction equipment and vehicles during management activities would contribute to emissions of criteria pollutants, toxic air contaminants, diesel particulate matter, and greenhouse gases (GHG). Earthmoving, grading, and vegetation removal activities during construction could result in fugitive dust. Vehicle trips and the use of mowers and other machinery associated with the establishment and management of the mitigation sites would be temporary and short-term during construction, and intermittent afterward. Ground-disturbing activities associated with the restoration of mitigation sites could result in impacts on known and previously unknown archaeological or historic resources. Existing project features and legal requirements would prevent the destruction or unauthorized alteration of such resources.

4.4.1 Impact BIO#1: Permanent Conversion or Degradation of Habitat for Special-Status Plant Species

Construction of the Preferred Alternative in the San Francisco to South San Francisco and San Bruno to San Mateo Subsections would take place in habitat that could support special-status plant species, including California seablite (listed under the federal Endangered Species Act [FESA]). Such activities could convert and disturb habitat and could result in the removal of special-status plant occurrences. This impact would also occur inside the San Francisco Bay Conservation and Development Commission's (BCDC) Bay and shoreline band jurisdiction.

Prior to ground-disturbing activity, the Authority will submit to the appropriate wildlife agencies the names and qualifications of project biologists, designated biologists, species-specific biological monitors, and general biological monitors retained to conduct biological resource monitoring activities and implement avoidance and minimization measures (BIO-IAMF#1). The project biologist will prepare a biological resources management plan (BRMP) consolidating permit

⁶ The Final EIR/EIS includes additional significant impacts (Impact BIO#8: Permanent Conversion or Degradation of Habitat for and Direct Mortality or Disturbance of Least Bell's Vireo, Yellow Warbler, and Tricolored Blackbird; Impact BIO#10: Permanent Conversion or Degradation of Habitat for and Direct Mortality of San Francisco Dusky-Footed Woodrat and Ringtail) that would occur under Alternative A only within the San Jose Diridon Station Approach Subsection. These impacts are not included in these findings because the San Jose Diridon Station Approach Subsection was approved by the Authority Board of Directors as part of the San Jose to Merced Project Section in April 2022.

conditions and an array of other requirements relevant to protection of sensitive biological resources (BIO-IAMF#5), including special-status plant habitat. Workers will be provided with environmental awareness training to help them understand their responsibilities in following procedures to reduce impacts and to increase their capability to identify and avoid special-status species present in the work area (BIO-IAMF#3). Staging areas will be sited away from sensitive resources (BIO-IAMF#8). Construction equipment will be cleaned before entering work areas to minimize opportunities for weeds and invasive species to enter the project footprint (BIO-IAMF#10). The Authority will develop and implement a best management practices (BMP) field manual addressing proper waste management and storage, nonstormwater management, and other general site cleanliness measures (BIO-IAMF#11).

While pre-construction and construction actions to protect special-status species are part of the project, these actions would not prevent the conversion of habitat and temporary disturbance of other habitat in the project footprint. Ground disturbance associated with construction activities could result in the removal of special-status plant occurrences if any are present in the project footprint. Ground disturbance could indirectly affect special-status species habitat by creating new areas of bare soil that are easily colonized by nonnative invasive plants. Such plants could spread into adjacent natural areas and outcompete native plants, including special-status species.

Therefore, even with the IAMFs that reduce the potential for direct impacts on special-status plants and minimize the loss of habitat, the project would result in loss and degradation of habitat and could result in the loss of special-status plant occurrences, which is considered a significant impact under CEQA (Authority 2022a: page 3.7-57).

The following measures mitigate this impact: BIO-MM#1: Prepare and Implement a Restoration and Revegetation Plan; BIO-MM#2: Prepare and Implement a Weed Control Plan; BIO-MM#3: Establish Environmentally Sensitive Areas and Nondisturbance Zones; BIO-MM#4: Conduct Monitoring of Construction Activities; BIO-MM#5: Establish and Implement a Compliance Reporting Program; BIO-MM#6: Conduct Presence/Absence Pre-Construction Surveys for Special-Status Plant Species and Special-Status Plant Communities; BIO-MM#7: Prepare and Implement Plan for Salvage, Relocation, or Propagation of Special-Status Plant Species; BIO-MM#8: Prepare a Compensatory Mitigation Plan for Species and Species Habitat; BIO-MM#9: Implement Measures to Minimize Impacts During Off-Site Habitat Restoration, or Enhancement, or Creation on Mitigation Sites; and BIO-MM#10: Compensate for Impacts on Listed Plant Species.

The Authority will implement mitigation measures to reduce the impacts on special-status plants. BIO-MM#1 involves preparation of a restoration and revegetation plan (RRP) that will identify and describe procedures for restoring temporarily disturbed habitat to its former state. BIO-MM#2 requires the project biologist to develop a weed control plan (WCP) prior to ground-disturbing activity to minimize and avoid the spread of invasive weeds into the project footprint and adjacent areas. BIO-MM#3 requires the project biologist to establish environmentally sensitive areas (ESA) and nondisturbance zones (including wildlife exclusion fencing [WEF], where applicable) that support special-status species or aquatic resources and are subject to seasonal restrictions or other avoidance and minimization measures prior to ground-disturbing activity. BIO-MM#4 and BIO-MM#5 require the project biologist to monitor construction activities for compliance with avoidance and minimization measures and established ESAs and nondisturbance zones and to document such monitoring through a compliance reporting program, respectively. BIO-MM#6 requires the project biologist to conduct presence/absence surveys for special-status plant species and special-status plant communities within the project footprint to be avoided during construction prior to any ground-disturbing activity. BIO-MM#7 requires preparation of a plan for the salvage and relocation of any special-status plant species found during presence/absence surveys prior to ground-disturbing activity. BIO-MM#8 will involve preparation and implementation of a compensatory mitigation plan (CMP) that will require creating, preserving, restoring, or enhancing habitat for special-status species in the regional RSA to compensate for permanent and temporary impacts on species habitat. BIO-MM#9 will minimize impacts associated with mitigation efforts. BIO-MM#10 requires compensatory mitigation for special-status plants at a 1:1

ratio. These measures will minimize direct and indirect impacts on habitat for special-status plants, provide for the avoidance or salvage and relocation of special-status plant occurrences in the project footprint, and compensate for impacts on habitat and any relocated plants. Therefore, these mitigation measures will be effective in minimizing the project's impacts associated with habitat conversion on special-status plants.

The Authority finds that BIO-MM#1, BIO-MM#2, BIO-MM#3, BIO-MM#4, BIO-MM#5, BIO-MM#6, BIO-MM#7, BIO-MM#8, BIO-MM#9, and BIO-MM#10 are required under the Preferred Alternative and that these mitigation measures will reduce the project's impacts on habitat conversion or degradation to special-status plants to a less-than-significant level.

4.4.2 Impact BIO#2b: Permanent Conversion or Degradation of Habitat for and Mortality of Monarch Butterfly

Construction of the Preferred Alternative would primarily affect suitable breeding and foraging habitat for monarch butterfly in the San Francisco to South San Francisco Subsection (near the Brisbane LMF) and the San Mateo to San Bruno Subsection (San Francisco International Airport [SFO] West-of-Bayshore property). Construction activities would convert and destroy suitable habitat and could result in individual fatalities of monarch butterfly larvae and adults if they are present in suitable habitat at the time of construction. Additionally, fugitive dust could temporarily affect host or nectar plants by covering leaves and reducing the vigor of plants. Similarly, fugitive dust during construction could also reduce the health and vigor of any monarch butterfly larvae present on host plants affected by fugitive dust, and could also affect the ability of adult monarch butterflies to lay eggs or feed on host and nectar plants covered in fugitive dust.

To avoid and minimize impacts on wildlife and plants from construction, the Authority has incorporated BIO-IAMF#1, BIO-IAMF#3, BIO-IAMF#5, BIO-IAMF#8, BIO-IAMF#9, BIO-IAMF#10, and BIO-IAMF#11 into the project. As these IAMFs are widely applicable to all species, they will also avoid and minimize impacts on monarch butterfly. These IAMFs and how they will avoid and minimize potential effects are described in Section 4.4.1, Impact BIO#1: Permanent Conversion or Degradation of Habitat for Special-Status Plant Species.

While actions taken before and during construction reduce the potential for harm to individuals and minimize the loss of habitat, the project would result in loss of habitat for monarch butterfly and could cause direct impacts on individuals (injury and mortality) if any are present in affected habitat. In the absence of measures to avoid, minimize, and offset impacts, such impacts would reduce the breeding habitat for the species and potentially numbers of individuals, which although only constituting a small portion of the range, would contribute to the decline of this species. Accordingly, this is considered a significant impact under CEQA (Authority 2022a: page 3.7-60).

The following measures mitigate this impact: BIO-MM#1; BIO-MM#5; BIO-MM#8; BIO-MM#9; BIO-MM#40: Avoid Direct Impacts on Listed Butterfly Host Plants; and BIO-MM#41: Provide Compensatory Mitigation for Impacts on Monarch Butterfly Habitat.

The Authority will implement mitigation measures to reduce the impacts on monarch butterfly, including BIO-MM#1, which requires the Authority to include host and nectar plants for butterflies in its RRP for temporarily affected areas, and BIO-MM#5, which outlines procedures for reporting compliance with all mitigation measures and regulatory agency authorizations. BIO-MM#8 and BIO-MM#41 entail preparation and implementation of a CMP that will require creating, preserving, restoring, or enhancing biological resources (including habitat for special-status species) to compensate for permanent impacts on such resources. BIO-MM#41 includes the details for monarch butterfly that will be incorporated into the CMP. BIO-MM#9 will minimize impacts on any special-status species occurring on lands proposed for off-site habitat restoration, enhancement, or creation. BIO-MM#40 requires pre-construction surveys for listed butterfly host plants in suitable habitat in work areas. If host plants are found, surveys for adult butterflies will occur to determine if the habitat is occupied, or presence will be assumed. Where adult butterflies are determined to be present or assumed to be present, host plants will be avoided in temporary impact areas. These measures will minimize direct and indirect impacts on monarch butterfly

habitat and individuals and permanently protect habitat to compensate for the permanent loss of habitat.

The Authority finds that BIO-MM#1, BIO-MM#5, BIO-MM#8, BIO-MM#9, BIO-MM#40, and BIO-MM#41 are required under the Preferred Alternative and that these mitigation measures will reduce the project's impacts on habitat loss or mortality to monarch butterfly to a less-than-significant level.

4.4.3 Impact BIO#3: Permanent Conversion or Degradation of Habitat for and Mortality of Central California Coast Steelhead, Pacific Lamprey, and Green Sturgeon, and Permanent Conversion or Degradation of Essential Fish Habitat

Construction of the Preferred Alternative would take place within or adjacent to habitat for special-status fish species, critical habitat, and designated essential fish habitat (EFH). Visitacion Creek and Guadalupe Valley Creek are tidally influenced and connected to San Francisco Bay and therefore may provide estuarine rearing habitat for central California coast (CCC) steelhead and foraging habitat for green sturgeon. Construction of the East Brisbane LMF under the Preferred Alternative would require the fill of a portion of Visitacion Creek to build the foundation of the LMF, resulting in the permanent conversion of fish habitat. Track modifications associated with LMF construction would require work in Guadalupe Valley Creek to accommodate widening of the existing bridge and a culvert extension. Four watercourses that cross the project footprint—Mills Creek, San Mateo Creek, San Francisquito Creek, and Stevens Creek—provide freshwater migration habitat for CCC steelhead and Pacific lamprey. Cordilleras Creek also provides freshwater migration habitat for Pacific lamprey.⁷ San Francisquito Creek and Stevens Creek are designated critical habitat for CCC steelhead. Construction-period vegetation management at these locations may involve removal or trimming of riparian trees that provide stream shading, moderating water temperatures conducive for fish movement, and providing food sources (e.g., leaves and arboreal invertebrates that fall into the water), resulting in habitat degradation. All of the above watercourses and Sanchez Creek are designated Pacific salmon EFH because they historically supported Chinook and coho salmon; Sanchez Creek is also designated Pacific Coast groundfish EFH. Because the above activities, as well as in-water work at Sanchez Creek to extend the existing box culvert, could adversely affect EFH for Pacific Coast salmon and Pacific Coast groundfish by altering the physical, chemical, or biological conditions of affected streams, consultation with the National Marine Fisheries Service (NMFS) would be required and impacts would be described in the biological assessment. This impact would also occur inside BCDC's Bay jurisdiction (Section 3.7.8.10, BCDC Jurisdictional Areas, of the Final EIR/EIS).

Prior to construction in areas with habitat for special-status fish, designated EFH, or both, the Authority will submit to the appropriate wildlife agencies the names and qualifications of project biologists, designated biologists, species-specific biological monitors, and general biological monitors retained to conduct biological resource monitoring activities and implement avoidance and minimization measures (BIO-IAMF#1). The project biologist will prepare a BRMP consolidating permit conditions and an array of other requirements relevant to protection of sensitive biological resources (BIO-IAMF#5). Workers will be provided with environmental awareness training to help them understand their responsibilities in following procedures to reduce impacts and to increase their capability to identify and sensitive resources present in the work area (BIO-IAMF#3). Staging areas will be sited away from sensitive resources (BIO-IAMF#8). The Authority will develop and implement a BMP field manual addressing proper waste

⁷ Two additional watercourses (Los Gatos Creek and Guadalupe River) that provide freshwater migration habitat for CCC steelhead and Pacific lamprey cross the project footprint in the San Jose Diridon Station Approach Subsection. Impacts on these watercourses are included in the Final EIR/EIS but are not included in these findings because the San Jose Diridon Station Approach Subsection was approved by the Authority Board of Directors as part of the San Jose to Merced Project Section in April 2022.

management and storage, nonstormwater management, and other general site cleanliness measures (BIO-IAMF#11).

While pre-construction actions to protect special-status species habitat are part of the project, these actions may not prevent the loss or temporary degradation of habitat for special-status fish in the project footprint or injury or mortality to individual fish in Guadalupe Valley Creek. Any riparian vegetation management activities would result in the degradation of aquatic habitat during construction and reduced value for some period of time after construction is completed and until riparian vegetation is restored.

Therefore, even with these IAMFs, the project could result in habitat conversion or degradation, or individual fatalities, for CCC steelhead, Pacific lamprey, and green sturgeon or permanent conversion of EFH, which is considered a significant impact under CEQA (Authority 2022a: page 3.7-61).

The following measures mitigate this impact: BIO-MM#1; BIO-MM#3; BIO-MM#4; BIO-MM#5; BIO-MM#8; BIO-MM#9; BIO-MM#12: Work Stoppage; BIO-MM#13: Restore Temporary Riparian Habitat Impacts; BIO-MM#14: Prepare Plan for Dewatering and Water Diversions; BIO-MM#15: Prepare and Implement a Cofferdam Fish Rescue Plan; BIO-MM#16: Prepare and Implement an Underwater Sound Control Plan; and BIO-MM#17: Provide Compensatory Mitigation for Permanent Impacts on Steelhead Habitat, Green Sturgeon Habitat, and Essential Fish Habitat.

The Authority will implement mitigation measures to reduce the impacts on CCC steelhead, Pacific lamprey, green sturgeon, and EFH. BIO-MM#1 involves preparation of an RRP that will identify and describe procedures for restoring temporarily disturbed habitat to its former state. BIO-MM#3 requires the project biologist to establish ESAs and nondisturbance zones that support special-status species or aquatic resources and are subject to seasonal restrictions or other avoidance and minimization measures prior to ground-disturbing activity. BIO-MM#4 and BIO-MM#5 require the project biologist to monitor construction activities for compliance with avoidance and minimization measures and established ESAs and nondisturbance zones and to document such monitoring through a compliance reporting program, respectively. BIO-MM#8 involves preparation and implementation of a CMP that will require creating, preserving, restoring, or enhancing habitat for special-status species in the regional RSA to compensate for permanent and temporary impacts on species habitat. BIO-MM#9 will minimize impacts associated with mitigation efforts. BIO-MM#12 gives the project biologist authority to halt any construction activities that could injure or kill individuals belonging to special-status species. BIO-MM#13 requires that the project biologist direct the revegetation of any riparian areas temporarily disturbed as a result of the construction activities, using appropriate native plants and seed mixes. BIO-MM#14 requires the Authority to prepare and implement a dewatering plan, which will incorporate measures to minimize turbidity and siltation, including pre-activity surveys by the project biologist. BIO-MM#15 requires the Authority to prepare and implement a fish rescue plan, which will outline the methods for removing and relocating fish to adjacent waterways and will also include methods for minimizing the risk of stress and mortality from capture and handling and adverse impacts on listed fish species associated with fish stranding. BIO-MM#16 requires the Authority to prepare and develop an underwater sound control plan to avoid and minimize potential adverse impacts from in-water pile-driving activities on federally listed special-status fish species. BIO-MM#17 requires the Authority to compensate for impacts on steelhead habitat, green sturgeon habitat, and EFH at a 2:1 ratio within critical habitat and at a 1:1 ratio or as specified in authorizations issued under the FESA outside of critical habitat. These measures are expected to minimize direct and indirect impacts on federally listed steelhead habitat, green sturgeon habitat, and EFH and individuals and to offset the loss of habitat. Therefore, these mitigation measures will be effective in minimizing the project's impacts associated with habitat conversion or degradation, or individual fatalities, for CCC steelhead, Pacific lamprey, and green sturgeon, or permanent conversion of EFH.

The Authority finds that BIO-MM#1, BIO-MM#3, BIO-MM#4, BIO-MM#5, BIO-MM#8, BIO-MM#9, BIO-MM#12, BIO-MM#13, BIO-MM#14, BIO-MM#15, BIO-MM#16, and BIO-MM#17 are required under the Preferred Alternative and that these mitigation measures will reduce the project's

impacts on CCC steelhead, Pacific lamprey, and green sturgeon, and EFH to a less-than-significant level.

4.4.4 Impact BIO#4: Permanent Conversion or Degradation of Habitat for and Direct Mortality of California Red-Legged Frog and Western Pond Turtle

Construction of the Preferred Alternative in all subsections except the San Francisco to South San Francisco Subsection would take place in or over habitat for the California red-legged frog, a species listed as threatened under the FESA and a California Department of Fish and Wildlife (CDFW) species of special concern, and western pond turtle, a CDFW species of special concern. Such activities would convert or disturb a small amount of habitat, and such activities in the San Bruno to San Mateo Subsection (i.e., next to the SFO West-of-Bayshore property) could result in the injury or mortality of individual red-legged frogs or pond turtles. Specifically, relocation of overhead contact system (OCS) poles associated with lateral track displacements next to the SFO West-of-Bayshore property may require ground disturbance in habitat for California red-legged frog and western pond turtle. This impact would also occur inside BCDC's shoreline band jurisdiction.⁸

Prior to construction in areas with habitat for California red-legged frog and western pond turtle, the Authority will submit to the appropriate wildlife agencies the names and qualifications of project biologists, designated biologists, species-specific biological monitors, and general biological monitors retained to conduct biological resource monitoring activities and implement avoidance and minimization measures (BIO-IAMF#1). The project biologist will prepare a BRMP consolidating permit conditions and an array of other requirements relevant to protection of sensitive biological resources (BIO-IAMF#5). Workers will be provided with environmental awareness training to help them understand their responsibilities in following procedures to reduce impacts and to increase their capability to identify and avoid red-legged frogs and western pond turtles potentially present in the work area (BIO-IAMF#3). Staging areas will be sited away from sensitive resources (BIO-IAMF#8). The Authority will develop and implement a BMP field manual addressing proper waste management and storage, nonstormwater management, and other general site cleanliness measures (BIO-IAMF#11).

During construction, several actions will be undertaken to protect red-legged frogs, western pond turtles, and other special-status wildlife. Erosion control materials that could entrap red-legged frogs and other terrestrial wildlife will be prohibited (BIO-IAMF#6) to prevent mortality and harm associated with inadvertent entrapment. Covering trenches, pits, and other excavations when not in use and inspecting them regularly (BIO-IAMF#7) will prevent frogs, turtles, and other terrestrial wildlife from falling into these areas and being trapped there.

While pre-construction and construction actions to protect special-status species are part of the project, these actions would not prevent the conversion of habitat and temporary disturbance of other habitat in the project footprint. Because frogs can be distributed throughout suitable habitats, their absence from construction areas cannot be guaranteed. Earthmoving, excavation, and vehicle operation during construction could crush, entomb, or physically disturb individual frogs. Ground disturbance, noise, and vibration associated with these activities could disrupt the activities of individual frogs and may impair normal life cycle behaviors. The use of chemicals and hazardous substances during construction (e.g., oils, gasoline) may cause mortality if individuals enter aquatic habitat that has been contaminated by spills or other vehicle and equipment leaks. While many protections will be implemented, the potential for physical harm and mortality of individuals would not be eliminated.

⁸ An additional watercourse (Guadalupe River) that provides habitat for California red-legged frog and western pond turtle crosses the project footprint in the San Jose Diridon Station Approach Subsection. Impacts with this watercourse are included in the Final EIR/EIS but are not included in these findings because the San Jose Diridon Station Approach Subsection was approved by the Authority Board of Directors as part of the San Jose to Merced Project Section in April 2022.

Therefore, even with these IAMFs, the project could result in habitat conversion or degradation, or individual fatalities, for California red-legged frog and western pond turtle, which is considered a significant impact under CEQA (Authority 2022a: page 3.7-63).

Implementation of the following measures mitigate this impact: BIO-MM#3, BIO-MM#4, BIO-MM#5, BIO-MM#8, BIO-MM#9, BIO-MM#12, BIO-MM#18: Conduct Pre-Construction Surveys for Special-Status Reptile and Amphibian Species, BIO-MM#19: Implement Avoidance and Minimization Measures for Special-Status Reptile and Amphibian Species, BIO-MM#20: Install San Francisco Garter Snake and California Red-Legged Frog Exclusion Fencing at SFO West-of-Bayshore Property, and BIO-MM#21: Compensate for Impacts on San Francisco Garter Snake and California Red-Legged Frog Habitat.

The Authority will implement mitigation measures to reduce the impacts on California red-legged frog and western pond turtle. BIO-MM#3 requires the project biologist to establish ESAs and nondisturbance zones (including WEF, where applicable) that support special-status species or aquatic resources and are subject to seasonal restrictions or other avoidance and minimization measures prior to ground-disturbing activity. BIO-MM#4 and BIO-MM#5 require the project biologist to monitor construction activities for compliance with avoidance and minimization measures and established ESAs and nondisturbance zones and to document such monitoring through a compliance reporting program, respectively. BIO-MM#8 involves preparation and implementation of a CMP that will require creating, preserving, restoring, or enhancing habitat for special-status species in the regional RSA to compensate for permanent and temporary impacts on species habitat. BIO-MM#9 will minimize impacts associated with mitigation efforts. BIO-MM#12 gives the project biologist authority to halt work to prevent the death or injury to special-status species found in a work area and to notify when work can be restarted. BIO-MM#18 requires the project biologist to conduct a pre-construction survey of the work area in order to guide the placement of ESAs or conduct species relocation for the California red-legged frog and western pond turtle. BIO-MM#19 requires the project biologist to monitor construction within suitable habitat for special-status reptile and amphibian species and to identify actions, to the extent feasible, sufficient to avoid impacts on any individuals of these special-status species observed in the construction area. BIO-MM#20 requires the contractor, under the direction of the project biologist, to install exclusion measures as required pursuant to regulatory authorizations issued under the FESA and for the project biologist to conduct daily inspections of the WEF prior to and during any construction activities inside the WEF from August to February. BIO-MM#21 requires the Authority to compensate for impacts on modeled California red-legged frog habitat at a 2:1 ratio within aquatic habitat and at a 1:1 ratio within refugia habitat. These measures are expected to minimize direct and indirect impacts on California red-legged frog and western pond turtle and to offset the loss of habitat.

Therefore, these mitigation measures will be effective in minimizing the project's impacts associated with habitat conversion or degradation, or individual fatalities, for California red-legged frog and western pond turtle.

The Authority finds that BIO-MM#3, BIO-MM#4, BIO-MM#5, BIO-MM#8, BIO-MM#9, BIO-MM#12, BIO-MM#18, BIO-MM#19, BIO-MM#20, and BIO-MM#21 are required under the Preferred Alternative and that these mitigation measures will reduce the project's impacts on California red-legged frog and western pond turtle to a less-than-significant level.

4.4.5 Impact BIO#5: Permanent Conversion or Degradation of Habitat for and Direct Mortality of San Francisco Garter Snake

Construction of the Preferred Alternative next to the SFO West-of-Bayshore property in the San Bruno to San Mateo Subsection would take place in or adjacent to habitat for San Francisco garter snake, a species listed as endangered under the FESA and California Endangered Species Act (CESA) and designated as fully protected under state law. Such activities would convert or disturb a small amount of habitat and could result in the injury or mortality of individual garter snakes. Specifically, relocation of OCS poles associated with lateral track displacements in this area may require ground disturbance in habitat for San Francisco garter snake. This impact would also occur inside BCDC's shoreline band jurisdiction.

Prior to construction in areas with habitat for San Francisco garter snake, the Authority will submit to the appropriate wildlife agencies the names and qualifications of project biologists, designated biologists, species-specific biological monitors, and general biological monitors retained to conduct biological resource monitoring activities and implement avoidance and minimization measures (BIO-IAMF#1). The project biologist will prepare a BRMP consolidating permit conditions and an array of other requirements relevant to protection of sensitive biological resources (BIO-IAMF#5). Workers will be provided with environmental awareness training to help them understand their responsibilities in following procedures to reduce impacts and to increase their capability to identify and avoid San Francisco garter snakes potentially present in the work area (BIO-IAMF#3). Staging areas will be sited away from sensitive resources (BIO-IAMF#8). The Authority will develop and implement a BMP field manual addressing proper waste management and storage, nonstormwater management, and other general site cleanliness measures (BIO-IAMF#11).

During construction, several actions will be undertaken to protect San Francisco garter snakes and other special-status wildlife. Erosion control materials that could entrap garter snakes and other terrestrial wildlife will be prohibited (BIO-IAMF#6) to prevent mortality and harm associated with inadvertent entrapment. Covering trenches, pits, and other excavations when not in use and inspecting them regularly (BIO-IAMF#7) will prevent garter snakes and other terrestrial wildlife from falling into these areas and being trapped there.

While pre-construction and construction actions to protect special-status species are part of the project, these actions would not prevent the conversion and temporary disturbance of habitat in the project footprint. Because San Francisco garter snakes use underground burrows and are therefore very difficult to detect, their absence from construction areas cannot be guaranteed. Earthmoving, excavation, and vehicle operation during construction could crush, entomb, or physically disturb individual snakes. Ground disturbance, noise, and vibration associated with these activities could disrupt the activities of individual snakes and may impair normal life cycle behaviors. The use of chemicals and hazardous substances during construction (e.g., oils, gasoline) may cause mortality if individuals enter aquatic habitat that has been contaminated by spills or other vehicle and equipment leaks. While many protections will be implemented, the potential for physical harm and mortality of individuals would not be eliminated.

Therefore, even with these IAMFs, the project could result in habitat conversion or degradation, or individual fatalities, for San Francisco garter snake, which is considered a significant impact under CEQA (Authority 2022a: page 3.7-64).

The following measures mitigate this impact: BIO-MM#3, BIO-MM#4, BIO-MM#5, BIO-MM#8, BIO-MM#9, BIO-MM#12, BIO-MM#18, BIO-MM#19, BIO-MM#20, and BIO-MM#21.

The Authority would implement mitigation measures to reduce the impacts on San Francisco garter snake. BIO-MM#3 requires the project biologist to establish ESAs and nondisturbance zones (including WEF, where applicable) that support special-status species or aquatic resources and are subject to seasonal restrictions or other avoidance and minimization measures prior to ground-disturbing activity. BIO-MM#4 and BIO-MM#5 require the project biologist to monitor construction activities for compliance with avoidance and minimization measures and established ESAs and nondisturbance zones and to document such monitoring through a compliance reporting program, respectively. BIO-MM#8 involves preparation and implementation of a CMP that will require creating, preserving, restoring, or enhancing habitat for special-status species in the regional RSA to compensate for permanent and temporary impacts on species habitat. BIO-MM#9 will minimize impacts associated with mitigation efforts. BIO-MM#12 gives the project biologist authority to halt work to prevent the death or injury to special-status species found in a work area and to notify when work can be restarted. BIO-MM#18 requires the project biologist to conduct a pre-construction survey of the work area in order to guide the placement of ESAs or conduct species relocation for the San Francisco garter snake. BIO-MM#19 requires the project biologist to monitor construction within suitable habitat for special-status reptile and amphibian species and to identify actions sufficient to avoid impacts on any of these special-status species observed in the construction area. BIO-MM#20 requires the contractor, under the direction of the

project biologist, to install exclusion measures as required pursuant to regulatory authorizations issued under the FESA and for the project biologist to conduct daily inspections of the WEF prior to and during any construction activities inside the WEF from August to February. BIO-MM#21 requires the Authority to compensate for impacts on modeled San Francisco garter snake habitat at a 2:1 ratio within aquatic habitat and at a 1:1 ratio within refugia habitat. These measures are expected to minimize direct and indirect impacts on San Francisco garter snake and to offset the loss of habitat. Therefore, these mitigation measures will be effective in minimizing the project's impacts associated with habitat conversion or degradation, or individual fatalities, for San Francisco garter snake.

The Authority finds that BIO-MM#3, BIO-MM#4, BIO-MM#5, BIO-MM#8, BIO-MM#9, BIO-MM#12, BIO-MM#18, BIO-MM#19, BIO-MM#20, and BIO-MM#21 are required under the Preferred Alternative and that these mitigation measures will reduce the project's impacts on San Francisco garter snake to a less-than-significant level.

4.4.6 Impact BIO#6: Permanent Conversion or Degradation of Habitat for and Direct Mortality or Disturbance of Burrowing Owl

Construction of the Preferred Alternative in the San Francisco to South San Francisco (i.e., in Brisbane) would take place in suitable habitat for the burrowing owl, a CDFW species of special concern.⁹ Nesting is not expected in Brisbane due to the lack of recent or historical nesting occurrences and low habitat quality but migrating or wintering individuals may occur from September to March in some years. Construction activities would convert and temporarily disturb habitat and could result in injury and mortality of individual owls and eggs, as well as nest abandonment. Ground disturbance and vehicle traffic could injure or kill burrowing owls by crushing occupied burrows or collapsing burrow entrances, trapping any owls inside. Although some burrowing owls in urban landscapes appear relatively tolerant of human disturbance (Poulin et al. 2011), it is difficult to predict how and at what distance a given nesting pair would react to noise and vibration. Consequently, it is possible that construction-generated noise and vibration near nest burrows could cause adult owls to abandon eggs or recently hatched young. Increased cover of invasive weeds could reduce habitat suitability for burrowing owls because they prefer areas with short, sparse vegetation (California Department of Fish and Game 2012). This impact would also occur inside BCDC's Bay and shoreline band jurisdiction.

Prior to ground-disturbing activity, the Authority will submit to the appropriate wildlife agencies the names and qualifications of project biologists, designated biologists, species-specific biological monitors, and general biological monitors retained to conduct biological resource monitoring activities and implement avoidance and minimization measures (BIO-IAMF#1). The project biologist will prepare a BRMP consolidating permit conditions and an array of other requirements relevant to protection of sensitive biological resources, including special-status species habitat (BIO-IAMF#5). Workers will be provided with environmental awareness training to help them understand their responsibilities in following procedures to reduce impacts and to increase their capability to identify and avoid special-status wildlife (BIO-IAMF#3). Staging areas will be sited away from sensitive resources (BIO-IAMF#8). The Authority will develop and implement a BMP field manual addressing proper waste management and storage, nonstormwater management, and other general site cleanliness measures (BIO-IAMF#11). Construction equipment will be cleaned before entering work areas to minimize opportunities for weeds and invasive species to enter the project footprint (BIO-IAMF#10).

While pre-construction and construction actions to minimize impacts on burrowing owl habitat are part of the project, these actions would not prevent the conversion and temporary disturbance of suitable habitat in the project footprint, nor would they eliminate the risk of injury, mortality, and

⁹ Construction of Alternative A would result in impacts on suitable habitat for burrowing owl in the San Jose Diridon Station Approach Subsection. These impacts are included in the Final EIR/EIS but are not included in these findings because the San Jose Diridon Station Approach Subsection was approved by the Authority Board of Directors as part of the San Jose to Merced Project Section in April 2022.

disturbance of individual owls. Therefore, even with these IAMFs, the project could result in habitat conversion or degradation, or individual fatalities, for burrowing owls, which is considered a significant impact under CEQA (Authority 2022a: page 3.7-65).

The following measures mitigate this impact: BIO-MM#1, BIO-MM#2, BIO-MM#3, BIO-MM#4, BIO-MM#5, BIO-MM#8, BIO-MM#9, BIO-MM#12, BIO-MM#22: Conduct Surveys for Burrowing Owls, BIO-MM#23: Implement Avoidance and Minimization Measures for Burrowing Owls, and BIO-MM#24: Provide Compensatory Mitigation for Loss of Active Burrowing Owl Burrows and Habitat.

Mitigation measures will reduce the impacts on burrowing owl. BIO-MM#1 involves preparation of an RRP that will identify and describe procedures for restoring temporarily disturbed habitat to its former state. BIO-MM#2 requires the project biologist to develop a WCP prior to ground-disturbing activity to minimize and avoid the spread of invasive weeds into the project footprint and adjacent areas. BIO-MM#3 requires the project biologist to establish ESAs and nondisturbance zones (including WEF, where applicable) that support special-status species or aquatic resources and are subject to seasonal restrictions or other avoidance and minimization measures prior to ground-disturbing activity. BIO-MM#4 and BIO-MM#5 require the project biologist to monitor construction activities for compliance with avoidance and minimization measures and established ESAs and nondisturbance zones and to document such monitoring through a compliance reporting program, respectively. BIO-MM#8 involves preparation and implementation of a CMP that will require creating, preserving, restoring, or enhancing habitat for special-status species in the regional RSA to compensate for permanent and temporary impacts on species habitat. BIO-MM#9 will minimize impacts associated with mitigation efforts. BIO-MM#12 provides the project biologist authority to halt work to prevent the death or injury to special-status species found in a work area and to notify when work can be restarted. BIO-MM#22 requires the project biologist to conduct pre-construction surveys prior to any ground-disturbing activity in burrowing owl habitat, in accordance with the Santa Clara Valley Habitat Plan's (SCVHP) condition of approval for covered activities in burrowing owl habitat and for burrowing owl within suitable habitat. BIO-MM#23 requires construction to avoid occupied burrowing owl burrows found during pre-construction surveys in accordance with the SCVHP's condition of approval for covered activities in burrowing owl habitat by establishing no-work buffers around occupied burrowing owl burrows in the work area. BIO-MM#24 requires the Authority to compensate for permanent impacts on occupied burrowing owl breeding and foraging habitat; which will require the Authority to provide compensatory mitigation at a minimum 1:1 ratio for occupied breeding and foraging habitat or other actions. These measures are expected to minimize direct and indirect impacts on burrowing owls and to offset the loss of habitat.

Therefore, these mitigation measures will be effective in minimizing the project's impacts associated with habitat conversion or degradation, or individual fatalities, for burrowing owls.

The Authority finds that BIO-MM#1, BIO-MM#2, BIO-MM#3, BIO-MM#4, BIO-MM#5, BIO-MM#8, BIO-MM#9, BIO-MM#12, BIO-MM#22, BIO-MM#23, and BIO-MM#24 are required under the Preferred Alternative and that these mitigation measures will reduce the project's impacts on burrowing owls to a less-than-significant level.

4.4.7 Impact BIO#7: Removal or Disturbance of Active Alameda Song Sparrow and Saltmarsh Common Yellowthroat Nests

Construction of the Preferred Alternative in the San Francisco to South San Francisco Subsection would take place in or adjacent to modeled nesting habitat for Alameda song sparrow and saltmarsh common yellowthroat, both of which are CDFW species of special concern. Specifically, track modifications and construction associated with the East Brisbane LMF would convert or temporarily disturb modeled nesting habitat (i.e., saline or freshwater emergent wetland) and could result in injury and mortality of individual birds and eggs, as well as nest abandonment. This impact would also occur inside BCDC's Bay and shoreline band jurisdiction.

Prior to construction in areas with nesting habitat for Alameda song sparrow and saltmarsh common yellowthroat, the Authority will submit to the appropriate wildlife agencies the names and

qualifications of project biologists, designated biologists, species-specific biological monitors, and general biological monitors retained to conduct biological resource monitoring activities and implement avoidance and minimization measures (BIO-IAMF#1). The project biologist will prepare a BRMP consolidating permit conditions and an array of other requirements relevant to protection of sensitive biological resources (BIO-IAMF#5). Workers will be provided with environmental awareness training to help them understand their responsibilities in following procedures to reduce impacts and to increase their capability to identify and avoid song sparrow and common yellowthroat nesting habitat in and adjacent to the work area (BIO-IAMF#3). Staging areas will be sited away from sensitive resources (BIO-IAMF#8). The Authority will develop and implement a BMP field manual addressing proper waste management and storage, nonstormwater management, and other general site cleanliness measures (BIO-IAMF#11). Construction equipment will be cleaned before entering work areas to minimize opportunities for weeds and invasive species to enter the project footprint (BIO-IAMF#10). While pre-construction actions to protect special-status species are part of the project, these actions would not prevent the conversion and temporary disturbance of habitat in the project footprint, nor would they necessarily eliminate the risk of injury, mortality, and disturbance of individual birds. Ground disturbance (e.g., grubbing during site preparation) in modeled nesting habitat for these species could crush eggs or kill nestlings in active nests. Construction-generated noise and vibration near active nests could cause adults to abandon eggs or recently hatched young if they perceive such disturbances as a threat. Increased cover of tall invasive weeds with thick stems and dense growth (e.g., thistles, mustard, perennial pepperweed) in grassland or marsh would reduce the herbaceous ground cover preferred for nesting by these species. Therefore, even with these IAMFs, the project could result in removal or disturbance of nesting habitat, or injury or individual fatalities of Alameda song sparrow and saltmarsh common yellowthroat, which is considered a significant impact under CEQA (Authority 2022a: page 3.7-66).

The following measures mitigate this impact: BIO-MM#12 and BIO-MM#25: Conduct Pre-Construction Surveys and Delineate Active Nest Buffers Exclusion Areas for Breeding Birds.

The Authority will implement mitigation measures to reduce the impacts on Alameda song sparrow and saltmarsh common yellowthroat. BIO-MM#12 provides for the project biologist authority to halt work to prevent the death or injury to special-status species found in a work area and to notify when work can be restarted. BIO-MM#25 requires the project biologist to conduct pre-construction surveys prior to any ground-disturbing activity in breeding bird habitat during the bird breeding season, in accordance with the Migratory Bird Treaty Act (MBTA), the California Fish and Game Code (Cal. Fish and Game Code), or both, in breeding bird habitat and for nesting birds and active nests. These measures are expected to minimize direct and indirect impacts on Alameda song sparrow and saltmarsh common yellowthroat and to offset the loss of habitat. Therefore, these mitigation measures will be effective in minimizing the project's impacts associated with removal or disturbance of nesting habitat, or injury or individual fatalities of Alameda song sparrow and saltmarsh common yellowthroat.

The Authority finds that BIO-MM#12 and BIO-MM#25 are required under the Preferred Alternative and that these mitigation measures will reduce the project's impacts on burrowing owls to a less-than-significant level.

4.4.8 Impact BIO#9: Removal or Disturbance of Active White-Tailed Kite Nests

Construction of the Preferred Alternative in all subsections would take place in or adjacent to nesting habitat for white-tailed kite, a fully protected species. Removal or trimming of trees or shrubs in mixed riparian, ornamental woodland, and coyote brush scrub land cover types could result in injury and mortality of individual birds and eggs, and these as well as other activities could result in nest abandonment. This impact would also occur inside BCDC's Bay and shoreline band jurisdiction.

Prior to construction in areas with nesting habitat for white-tailed kite, the Authority will submit to the appropriate wildlife agencies the names and qualifications of project biologists, designated biologists, species-specific biological monitors, and general biological monitors retained to conduct biological resource monitoring activities and implement avoidance and minimization

measures (BIO-IAMF#1). The project biologist will prepare a BRMP consolidating permit conditions and an array of other requirements relevant to protection of sensitive biological resources (BIO-IAMF#5). Workers will be provided with environmental awareness training to help them understand their responsibilities in following procedures to reduce impacts and to increase their capability to identify and avoid white-tailed kite nesting habitat in and adjacent to the work area (BIO-IAMF#3). Staging areas will be sited away from sensitive resources (BIO-IAMF#8).

While pre-construction actions to protect special-status species are part of the Preferred Alternative, these actions would not prevent the conversion and temporary disturbance of habitat in the project footprint, nor would they necessarily eliminate the risk of injury, mortality, and disturbance of individual birds. Vegetation removal in nesting habitat for this species could crush eggs or kill nestlings in active nests. Construction-generated noise and vibration near active nests could cause adults to abandon eggs or recently hatched young if they perceive such disturbances as a threat. Therefore, even with these IAMFs, the project could result in removal or disturbance of nesting habitat, or injury or individual fatalities of white-tailed kite, which is considered a significant impact under CEQA (Authority 2022a: page 3.7-68).

The following measures mitigate this impact: BIO-MM#12 and BIO-MM#25.

The Authority will implement mitigation measures to reduce the impacts on white-tailed kite. BIO-MM#12 provides the project biologist authority to halt work to prevent the death or injury to special-status species found in a work area and to notify when work can be restarted. BIO-MM#25 requires the project biologist to conduct pre-construction surveys prior to any ground-disturbing activity in breeding bird habitat during the bird breeding season, in accordance with the MBTA, Cal. Fish and Game Code, or both, in breeding bird habitat and for nesting birds and active nests. These measures are expected to minimize direct and indirect impacts on white-tailed kite and to offset the loss of habitat. Therefore, these mitigation measures will be effective in minimizing the project's impacts associated with removal or disturbance of nesting habitat, or injury or individual fatalities of white-tailed kite.

The Authority finds that BIO-MM#12 and BIO-MM#25 are required under the Preferred Alternative and that these mitigation measures will reduce the project's impacts on least white-tailed kite to a less-than-significant level.

4.4.9 Impact BIO#12: Loss of Roost Sites for and Direct Mortality or Disturbance of Special-Status Bats

Construction of the Preferred Alternative in all subsections would take place near bridges or trees that provide roosting habitat for pallid bat, Townsend's big-eared bat, and western red bat, all of which are CDFW species of special concern. Construction activities would convert and temporarily disturb roosting habitat and could result in the disturbance, injury, and mortality of individual bats and the disruption of both night and maternity roost sites. The loss of roosting habitat is considered one of the primary conservation issues facing bat populations, with loss of maternity roosts considered especially significant (Caltrans 2004: page 21). This impact would also occur inside BCDC's Bay jurisdiction.

Prior to construction in areas with roosting habitat for special-status bats, the Authority will submit to the appropriate wildlife agencies the names and qualifications of project biologists, designated biologists, species-specific biological monitors, and general biological monitors retained to conduct biological resource monitoring activities and implement avoidance and minimization measures (BIO-IAMF#1). The project biologist will prepare a BRMP consolidating permit conditions and an array of other requirements relevant to protection of sensitive biological resources (BIO-IAMF#5). Workers will be provided with environmental awareness training to help them understand their responsibilities in following procedures to reduce impacts and to increase their capability to identify and avoid bat roosts in and adjacent to the work area (BIO-IAMF#3). Staging areas will be sited away from sensitive resources (BIO-IAMF#8).

While pre-construction actions to protect special-status bats are part of the Preferred Alternative, these actions would not prevent the conversion and temporary disturbance of roosting habitat in

the project footprint, nor would they necessarily eliminate the risk of disturbance, injury, or mortality of individual bats or the disruption of roost sites. Structure demolition (e.g., removal or modification of culverts and bridges) in suitable habitat for these species could destroy occupied roost sites, resulting in injury or mortality of adults and young. Construction-generated noise and vibration near potential roost sites could disturb maternity roosts and cause bats to abandon their young. Therefore, even with these IAMFs, the project could result in the loss or disturbance of roosting habitat, or individual fatalities, of special-status bat species, which is considered a significant impact under CEQA (Authority 2022a: page 3.7-71).

The following measures mitigate this impact: BIO-MM#30: Conduct Pre-Construction Surveys for Special-Status Bat Species, BIO-MM#31: Implement Bat Avoidance and Relocation Measures, and BIO-MM#32: Implement Bat Exclusion and Deterrence Measures.

The Authority will implement mitigation measures to reduce the impacts on special-status bats. BIO-MM#30 requires the project biologist, prior to replacement or modification of any bridges modeled as bat habitat and the removal of large trees, to conduct pre-construction surveys for potentially active bat roosts. BIO-MM#31 requires construction to avoid active hibernacula or maternity roosts found during pre-construction surveys and will provide for the project biologist, if avoidance is not feasible, to prepare a relocation plan and provide for an alternative bat roost outside the project footprint. BIO-MM#32 requires the project biologist to facilitate the eviction of the bats by either opening the roosting area to change the lighting and airflow conditions or installing one-way doors or other appropriate methods if nonbreeding or no hibernating individuals or groups of bats are found roosting within the work area. These measures are expected to minimize or avoid direct impacts on individuals. Therefore, these mitigation measures will be effective in minimizing the project's impacts associated with habitat conversion or degradation, or individual fatalities, of special-status bat species.

The Authority finds that BIO-MM#30, BIO-MM#31, and BIO-MM#32 are required under the Preferred Alternative and that these mitigation measures will reduce the project's impacts on special-status bat species.

4.4.10 Impact BIO#14: Intermittent Disturbance of Habitat for and Direct Mortality of Special-Status Wildlife during Operations

Operations of the Preferred Alternative would include passing HSR trains and inspection and maintenance activities along the Caltrain right-of-way, at stations, and at the East Brisbane LMF. Most of the right-of-way has been previously subjected to extensive ground disturbance and provides limited habitat for most special-status wildlife.

Prior to on-site maintenance and inspection activities, the Authority will require that all operations and maintenance (O&M) personnel attend worker environmental awareness program (WEAP) training about sensitive biological resources within and adjacent to the right-of-way (BIO-IAMF#4). Training materials will identify and describe land cover types that may support special-status wildlife species (i.e., saline emergent wetland, freshwater emergent wetland, all land cover adjacent to the SFO West-of-Bayshore property) and their approximate locations within or adjacent to the right-of-way.

While special-status amphibians, reptiles, and mammals with small body sizes may still be able to access and occasionally move through or along the right-of-way, any features that once supported breeding (e.g., aquatic features) would either be removed or degraded during construction. Any special-status species individuals that do use enter the right-of-way after construction would be subjected to increased mortality risk from the addition of HSR trains operating at speeds up to 110 mph. This impact would also occur inside BCDC's Bay and shoreline band jurisdiction. However, even with this IAMF, operation of the project could result in disturbance or degradation of habitat, or individual fatalities, for special-status wildlife, which is considered a significant impact under CEQA (Authority 2022a: page 3.7-72).

The following measures mitigate this impact: BIO-MM#33: Install Aprons or Barriers within Security Fencing, and BIO-MM#34: Minimize Permanent Intermittent Impacts on Aerial Species Movement.

The Authority will implement mitigation measures to reduce the impacts on special-status wildlife. BIO-MM#33 will allow for the project biologist to review, prior to final construction design, the fencing plans along any portion of the permanent right-of-way that is adjacent to natural habitats and confirm that the permanent security fencing would be enhanced with a barrier (e.g., fine mesh fencing) to prevent special-status reptiles, amphibians, and mammals from moving through or underneath the fencing and gaining access to areas within the right-of-way. BIO-MM#34 requires the Authority to implement deterrent and diversion features for avian species that include installing pigeon wire to discourage birds from perching on OCS throughout the project; placing flight barriers such as fencing, pole barriers, or a tubular screen; modifying OCS poles to preclude bird entrapment in hollow poles; and designing aerial structures and tunnel portals to discourage bats from roosting in expansion joints or other crevices. These measures are expected to minimize or avoid direct impacts on special-status wildlife individuals. Therefore, these mitigation measures will be effective in minimizing the project's impacts associated with disturbance or degradation of habitat, or individual fatalities, for special-status wildlife.

The Authority finds that BIO-MM#33 and BIO-MM#34 are required under the Preferred Alternative and that these mitigation measures will reduce the project's impacts on special status wildlife to a less-than-significant level.

4.4.11 Impact BIO#18: Permanent Conversion or Degradation of Special-Status Plant Communities

Construction of the Preferred Alternative would take place adjacent to saline emergent wetlands that support pickleweed mats and within or adjacent to mixed riparian and scrub/shrub wetland land cover that may support arroyo willow thickets. Pickleweed mats and arroyo willow thickets are listed on the CDFW Sensitive Natural Communities List (CDFW 2018). Construction would result in the conversion and degradation of these communities if present within mapped land cover types. This impact would also occur inside BCDC's Bay and shoreline band jurisdiction.

Prior to construction in areas that could support special-status plant communities, the project biologist will prepare a BRMP consolidating permit conditions and an array of other requirements relevant to protection of sensitive biological resources (BIO-IAMF#5), including special-status plant communities. Workers will be provided with environmental awareness training to help them understand their responsibilities in following procedures to reduce impacts and to increase their capability to identify and avoid sensitive resources present in the work area (BIO-IAMF#3). Staging areas will be sited away from sensitive resources (BIO-IAMF#8).

During construction, several actions incorporated into the Preferred Alternative will be undertaken specifically to protect special-status plant communities. Cleaning of construction equipment (BIO-IAMF#10) will help to reduce the spread of invasive plant species and changes in vegetation structure. The contractor will develop a BMP field manual that will address proper waste management and storage, nonstormwater management, and other general site cleanliness measures to avoid spills of hazardous materials, reducing degradation of special-status plant communities (BIO-IAMF#9). The Authority will develop and implement a BMP field manual addressing proper waste management and storage, nonstormwater management, and other general site cleanliness measures (BIO-IAMF#11).

While pre-construction and construction actions to protect special-status plant communities are part of the project, these actions may not prevent the permanent conversion or temporary disturbance of special-status plant communities in the project footprint. Replacement of the Tunnel Avenue overpass near Brisbane Lagoon in the San Francisco to South San Francisco Subsection may temporarily disturb small areas of pickleweed mats in the lagoon. Track and associated structure modifications near mixed riparian land cover at stream crossings in all subsections may require trimming or removal of arroyo willow thickets. Construction of the LMF in Brisbane would remove scrub/shrub wetlands known to contain arroyo willow thickets. Ground

disturbance could indirectly affect special-status plant communities by creating new areas of bare soil that are easily colonized by nonnative invasive plants. Such plants could spread into and degrade adjacent special-status plant communities. Therefore, even with these IAMFs, the project could result in conversion or degradation of special-status plant communities, which is considered a significant impact under CEQA (Authority 2022a: page 3.7-77).

The following measures mitigate this impact: BIO-MM#1, BIO-MM#2, BIO-MM#3, BIO-MM#4, BIO-MM#5, BIO-MM#6, BIO-MM#13, BIO-MM#35: Provide Compensatory Mitigation for Permanent Impacts on Riparian Habitat, BIO-MM#36: Restore Aquatic Resources Subject to Temporary Impacts, and BIO-MM#37: Prepare and Implement a Compensatory Mitigation Plan for Impacts on Aquatic Resources.

The Authority will implement mitigation measures to reduce the impacts on special-status plant species. BIO-MM#1 involves preparation of an RRP that will identify and describe procedures for restoring temporarily disturbed habitat to its former state. BIO-MM#2 requires the project biologist to develop a WCP prior to ground-disturbing activity to minimize and avoid the spread of invasive weeds into the project footprint and adjacent areas. BIO-MM#3 requires the project biologist to establish ESAs and nondisturbance zones (including WEF, where applicable) that support special-status species or aquatic resources and are subject to seasonal restrictions or other avoidance and minimization measures prior to ground-disturbing activity. BIO-MM#4 and BIO-MM#5 require the project biologist to monitor construction activities for compliance with avoidance and minimization measures and established ESAs and nondisturbance zones and to document such monitoring through a compliance reporting program, respectively. BIO-MM#6 requires the project biologist to conduct presence/absence surveys for special-status plant species and special-status plant communities within the project footprint to be avoided during construction prior to any ground-disturbing activity. BIO-MM#13 requires that the project biologist direct the revegetation of any riparian areas temporarily disturbed as a result of the construction activities, using appropriate native plants and seed mixes. BIO-MM#35 requires the Authority to compensate for permanent impacts on riparian habitats at a ratio of 2:1, unless a higher ratio is required by agencies with regulatory jurisdiction over the resource. BIO-MM#36 will require the Authority to revegetate affected aquatic resources using appropriate native plants and seed mixes (from local vendors where available). BIO-MM#37 requires the Authority to prepare and implement a CMP that identifies compensatory mitigation such as the restoration, establishment, enhancement, and/or preservation of aquatic resources to address temporary and permanent loss of aquatic resources. Specific ratios are specified for seasonal wetlands, other wetland types, and nonwetlands; and on-site and off-site mitigation. These measures are expected to minimize direct and indirect impacts on special-status plant communities and to offset the loss of habitat. Therefore, these mitigation measures will be effective in minimizing the project's impacts associated with conversion or degradation of special-status plant communities.

The Authority finds that BIO-MM#1, BIO-MM#2, BIO-MM#3, BIO-MM#4, BIO-MM#5, BIO-MM#6, BIO-MM#13, BIO-MM#35, BIO-MM#36, and BIO-MM#37 are required under the Preferred Alternative and that these mitigation measures will reduce the project's impacts on conversion or degradation of special-status plant communities to a less-than-significant level.

4.4.12 Impact BIO#20: Permanent Conversion or Degradation of Aquatic Resources Considered Jurisdictional under Section 404 of the Federal Clean Water Act and the State Porter-Cologne Act, or under Section 10 of the Rivers and Harbors Act

Construction of the Preferred Alternative would take place in areas that support aquatic resources considered jurisdictional under Section 404 of the Clean Water Act (CWA) and the state Porter-Cologne Act, or navigable waters considered jurisdictional under Section 10 of the Rivers and Harbors Act (RHA). Construction may result in the conversion and degradation of such aquatic resources through direct removal, filling, and hydrological interruption. Construction may also result in discharges that could adversely affect navigable waters.

The Preferred Alternative would require the construction of new bridges or culverts for the railbed, roadways, and other infrastructure to cross over watercourses, or the modification of existing bridges and culverts for the same purpose. To complete this work, the contractor may need to perform minor trimming of vegetation or other activities in or near wetlands or nonwetland waters that cross below or run parallel to the railbed. Some of this work may need to be conducted from within these features. Temporary stream diversions would be needed to conduct the work within perennial watercourses.

Prior to construction in areas that could support aquatic resources, the project biologist will prepare a BRMP consolidating permit conditions and an array of other requirements relevant to protection of sensitive biological resources (BIO-IAMF#5). Workers will be provided with environmental awareness training to help them understand their responsibilities in following procedures to reduce impacts and to increase their capability to identify and sensitive resources present in the work area (BIO-IAMF#3). Staging areas will be sited away from sensitive resources (BIO-IAMF#8).

During construction, several actions incorporated into the Preferred Alternative will be undertaken specifically to protect aquatic resources. Cleaning of construction equipment (BIO-IAMF#10) will help to reduce the spread of invasive plant species into wetlands. The contractor will develop a BMP field manual that will address proper waste management and storage, nonstormwater management, and other general site cleanliness measures to avoid spills of hazardous materials, reducing degradation of aquatic resources (BIO-IAMF#9).

While pre-construction and construction actions to protect aquatic resources are part of the project, these actions would not prevent the permanent conversion or temporary disturbance of aquatic resources in the project footprint. Construction activities would also result in the temporary disturbance of aquatic resources during construction and reduced value for some time after construction is completed until aquatic resources are restored and recover. Therefore, even with these IAMFs, the project could result in conversion or degradation of jurisdictional aquatic resources, which is considered a significant impact under CEQA (Authority 2022a: page 3.7-81).

The following measures mitigate this impact: BIO-MM#1, BIO-MM#2, BIO-MM#3, BIO-MM#4, BIO-MM#5, BIO-MM#13, BIO-MM#35, BIO-MM#36, and BIO-MM#37.

The Authority will implement mitigation measures to reduce the impacts on aquatic resources. BIO-MM#1 involves preparation of an RRP that will identify and describe procedures for restoring temporarily disturbed habitat to its former state. BIO-MM#2 requires the project biologist to develop a WCP prior to ground-disturbing activity to minimize and avoid the spread of invasive weeds into the project footprint and adjacent areas. BIO-MM#3 requires the project biologist to establish ESAs and nondisturbance zones (including WEF, where applicable) that support special-status species or aquatic resources and are subject to seasonal restrictions or other avoidance and minimization measures prior to ground-disturbing activity. BIO-MM#4 and BIO-MM#5 require the project biologist to monitor construction activities for compliance with avoidance and minimization measures and established ESAs and nondisturbance zones and to document such monitoring through a compliance reporting program, respectively. BIO-MM#13 requires that the project biologist direct the revegetation of any riparian areas temporarily disturbed as a result of the construction activities, using appropriate native plants and seed mixes. BIO-MM#35 requires the Authority to compensate for permanent impacts on riparian habitats at a ratio of 2:1, unless a higher ratio is required by agencies with regulatory jurisdiction over the resource. BIO-MM#36 requires the Authority to revegetate affected aquatic resources using appropriate native plants and seed mixes (from local vendors where available). BIO-MM#37 requires the Authority to prepare and implement a CMP that identifies compensatory mitigation such as the restoration, establishment, enhancement, and/or preservation of aquatic resources to address temporary and permanent loss of aquatic resources. Specific ratios are specified for seasonal wetlands, other wetland types, and nonwetlands; and on-site and off-site mitigation.

Therefore, these mitigation measures will be effective in minimizing the project's impacts associated with conversion or degradation of jurisdictional aquatic resources, and compensate for permanent impacts on aquatic resources.

The Authority finds that BIO-MM#1, BIO-MM#2, BIO-MM#3, BIO-MM#4, BIO-MM#5, BIO-MM#13, BIO-MM#35, BIO-MM#36, and BIO-MM#37 are required under the Preferred Alternative and that these mitigation measures will reduce the project's impacts on conversion or degradation of jurisdictional aquatic resources to a less-than-significant level.

4.4.13 Impact BIO#21: Permanent Conversion or Degradation of Aquatic Resources, including Riparian Communities, Subject to Notification under California Fish and Game Code Section 1600 et seq.

Construction of the Preferred Alternative in all subsections would take place in areas that support rivers and streams subject to notification under Cal. Fish and Game Code Section 1600 et seq., including riparian communities (i.e., mixed riparian). Construction may result in the conversion and degradation of such aquatic and riparian habitat that supports fish and wildlife. Some of these resources are located in BCDC's Bay and shoreline band jurisdiction.

Prior to construction in a resource covered under Section 1602, the project biologist will prepare a BRMP consolidating permit conditions and an array of other requirements relevant to protection of sensitive biological resources (BIO-IAMF#5). Workers will be provided with environmental awareness training to help them understand their responsibilities in following procedures to reduce impacts and to increase their capability to identify and sensitive resources present in the work area (BIO-IAMF#3). Staging areas will be sited away from sensitive resources (BIO-IAMF#8).

During construction, several actions that the Authority has incorporated into Preferred Alternative design will be undertaken specifically to protect aquatic resources and species dependent on such resources. Cleaning of construction equipment (BIO-IAMF#10) will help to reduce the spread of invasive plant species into wetlands and riparian areas. The contractor will develop a BMP field manual that would address proper waste management and storage, nonstormwater management, and other general site cleanliness measures to avoid spills of hazardous materials, reducing degradation of aquatic resources (BIO-IAMF#9).

While pre-construction and construction actions to protect Section 1600 resources are part of the Preferred Alternative, these actions would not prevent the permanent conversion or temporary disturbance of aquatic resources in the project footprint. Construction activities would result in the temporary disturbance of Section 1600 resources during construction and reduced value to fish and wildlife using those resources for some time after construction is completed until resources are restored and recover. Therefore, even with these IAMFs, the project could result in conversion or degradation of aquatic resources, including riparian communities, which is considered a significant impact under CEQA (Authority 2022a: page 3.7-82).

The following measures mitigate this impact: BIO-MM#1, BIO-MM#2, BIO-MM#3, BIO-MM#4, BIO-MM#5, BIO-MM#13, BIO-MM#35, BIO-MM#36, and BIO-MM#37.

The Authority will implement mitigation measures to reduce the impacts on aquatic resources, including riparian communities, regulated subject to notification under Cal. Fish and Game Code Section 1600 et seq. BIO-MM#1 involves preparation of an RRP that will identify and describe procedures for restoring temporarily disturbed habitat to its former state. BIO-MM#2 requires the project biologist to develop a WCP prior to ground-disturbing activity to minimize and avoid the spread of invasive weeds into the project footprint and adjacent areas. BIO-MM#3 requires the project biologist to establish ESAs and nondisturbance zones (including WEF, where applicable) that support special-status species or aquatic resources and are subject to seasonal restrictions or other avoidance and minimization measures prior to ground-disturbing activity. BIO-MM#4 and BIO-MM#5 require the project biologist to monitor construction activities for compliance with avoidance and minimization measures and established ESAs and nondisturbance zones and to document such monitoring through a compliance reporting program, respectively. BIO-MM#13 requires the project biologist to direct the revegetation of any riparian areas temporarily disturbed as a result of the construction activities, using appropriate native plants and seed mixes. BIO-MM#35 requires the Authority to compensate for permanent impacts on riparian habitats at a ratio of 2:1, unless a higher ratio is required by agencies with regulatory jurisdiction over the resource.

BIO-MM#36 requires the Authority to revegetate affected aquatic resources using appropriate native plants and seed mixes (from local vendors where available). BIO-MM#37 requires the Authority to prepare and implement a CMP that identifies compensatory mitigation such as the restoration, establishment, enhancement, and/or preservation of aquatic resources to address temporary and permanent loss of aquatic resources. Specific ratios are specified for seasonal wetlands, other wetland types, and nonwetlands; and on-site and off-site mitigation. Therefore, these mitigation measures will be effective in minimizing the project's impacts associated with conversion or degradation on aquatic habitat and riparian communities, and compensate for permanent impacts on aquatic resources and riparian communities.

The Authority finds that BIO-MM#1, BIO-MM#2, BIO-MM#3, BIO-MM#4, BIO-MM#5, BIO-MM#13, BIO-MM#35, BIO-MM#36, and BIO-MM#37 are required under the Preferred Alternative and that these mitigation measures will reduce the project's impacts on conversion or degradation of aquatic resources and riparian communities to a less-than-significant level.

4.4.14 Impact BIO#22: Intermittent Disturbance or Degradation of Aquatic Resources during Operations

Operation of the Preferred Alternative would include inspection and maintenance activities along the Caltrain right-of-way, at stations, and at the East Brisbane LMF. Right-of-way maintenance activities would include minor grading, clearing, and excavation needed to maintain adequate drainage or repair infrastructure; vegetation management, including potential trimming of riparian trees growing adjacent to the right-of-way and application of herbicide to invasive weeds within the right-of-way; and vehicle traffic along maintenance roads. Permanently affected aquatic features in the project footprint would have been eliminated during construction, and therefore would not be affected further. Aquatic resources inside the project footprint that were avoided during construction (e.g., natural watercourses spanned by bridges) and outside but adjacent to the project footprint would remain and could potentially be affected by these activities. In addition, construction would result in the creation of new aquatic resources (e.g., constructed basins and watercourses for drainage) in some portions of the project footprint, and these features could also be affected. Minor ground disturbance within the right-of-way may result in minor direct (e.g., filling, sedimentation, inadvertent release of oils and chemicals from parked vehicles or equipment) or indirect (e.g., introduction of invasive species) impacts on aquatic resources in and adjacent to the right-of-way. Occasional trimming of riparian tree branches overhanging the right-of-way is not expected to substantially degrade riparian aquatic resources because the branches of such trees are typically fast growing. If applied during high winds, herbicides could drift into aquatic resources in and beyond the right-of-way, degrading water quality and causing mortality of wetland vegetation. Dust generated by maintenance vehicles could settle on the leaves of wetland plants in and adjacent to the right-of-way, increasing the rate of water loss (i.e., transpiration). Such impacts would degrade aquatic resources remaining in the right-of-way after construction as well as those outside but within 250 feet (i.e., aquatic RSA) of the right-of-way. This impact would also occur inside BCDC's Bay and shoreline band jurisdiction.

Prior to on-site maintenance and inspection activities, the Authority will require that all O&M personnel attend WEAP training about sensitive biological resources (BIO-IAMF#4) within and adjacent to the right-of-way. Training materials will identify and describe Section 1600 resources that remain within or adjacent to the right-of-way (i.e., constructed basins at Brisbane Lagoon, natural and constructed watercourses and mixed riparian land cover that cross the right-of-way). This action will avoid and minimize impacts on remaining aquatic resources inside and adjacent to the project footprint during operations.

While pre-construction and construction actions to protect aquatic resources are part of the project, these actions would not prevent the permanent conversion or degradation of aquatic resources in the project footprint without mitigation measures. Therefore, even with this IAMF, operations of the project could result in conversion or degradation of aquatic resources, which is considered a significant impact under CEQA (Authority 2022a: page 3.7-83).

The following measure mitigates this impact: BIO-MM#38: Prepare and Implement an Annual Vegetation Control Plan.

The Authority will implement a mitigation measure to reduce the impacts on aquatic resources during operations. BIO-MM#38 requires the Authority to prepare an annual vegetation control plan that will describe site-specific vegetation control methods such as chemical vegetation control methods, mowing program consistent with Section 1415 of the Fixing America's Surface Transportation Act, other nonchemical vegetation control, and other chemical pest control methods to address vegetation removal for the purpose of maintaining clear areas around facilities, reducing the risk of fire, and controlling invasive weeds during the operational phase. This measure is expected to minimize direct and indirect impacts on aquatic resources. Therefore, this mitigation measure, combined with the intermittent and widely dispersed nature of effects from inspection and maintenance activities, will be effective in minimizing the project's impacts on aquatic resources.

The Authority finds that BIO-MM#38 is required under the Preferred Alternative and that this mitigation measure will reduce the project's impacts on aquatic resources to a less-than-significant level.

4.4.15 Impact BIO#23: Removal of Trees Protected under Municipal Tree Ordinances

Ground disturbance and vegetation removal activities associated with construction of the Preferred Alternative could require removal or trimming of protected trees. Direct impacts on protected trees would be permanent if such trees are removed or have significant pruning to either the canopy or roots, grading or compaction in the root zone, or significantly modified drainage patterns (primarily causing water to pond in the root zone) during construction; impacts would be considered temporary if trees are minimally trimmed or their root systems have minor disruption. Any protected trees in the project footprint are in a dense urban setting and are adapted to a human-modified environment, including pavement and compaction of the root zone and the proliferation of introduced nonnative plants. The Preferred Alternative may have indirect impacts on protected trees outside the project footprint in natural settings as a result of grading and drainage pattern modifications that may cause compaction of the tree's root zone or increase ponding of water that causes anaerobic condition and root decay.

Prior to construction, the project biologist will prepare a BRMP consolidating permit conditions and an array of other requirements relevant to protection of sensitive biological resources (BIO-IAMF#5). Workers will be provided with environmental awareness training to help them understand their responsibilities in following procedures to reduce impacts and to increase their capability to identify and sensitive resources present in the work area (BIO-IAMF#3). Staging areas will be sited away from sensitive resources (BIO-IAMF#8).

While pre-construction actions to identify and preserve protected trees are part of the project, these actions would not entirely preclude impacts on protected trees. Some trees would be removed and others would be trimmed to facilitate project construction. Therefore, even with these IAMFs, the project could result in removal or trimming of protected trees, which is considered a significant impact under CEQA (Authority 2022a: page 3.7-84).

The following measure mitigates this impact: BIO-MM#39: Implement Transplantation and Compensatory Mitigation Measures for Protected Trees.

The Authority will implement a mitigation measure to reduce the impacts on protected trees during construction. BIO-MM#39 requires the project biologist to conduct surveys in the work area to identify protected trees. Therefore, this mitigation measure will be effective in minimizing the project's impacts associated with removal or trimming of protected trees.

The Authority finds that BIO-MM#39 is required under the Preferred Alternative and that this mitigation measure will reduce the project's impacts on protected trees to a less-than-significant level.

4.5 Hydrology and Water Resources (Section 3.8 in the Final EIR/EIS)

The Preferred Alternative would result in potentially significant temporary and permanent impacts on surface water quality during construction. All potentially significant impacts would be mitigated to less than significant.

These findings address impacts associated with the Preferred Alternative. Because of length, the full mitigation measure text is presented separately in the MMEP.

4.5.1 Impact HYD#4: Temporary Impacts on Surface Water Quality during Construction

Temporary construction impacts on surface water quality would result from disturbed soil, construction materials and waste, and work in aquatic resources, which would include temporary stream diversion and dewatering. Construction of the Preferred Alternative would require grading, excavation, vegetation clearing, operation of heavy equipment, and other activities that would disturb, destabilize, and stockpile soil. These construction activities are sources of sediment that would need to be controlled to prevent sediment-laden runoff from entering aquatic resources. Project features will minimize impacts. However, temporary impacts on surface water quality would result from construction, dewatering, and potentially encountering hazardous materials.

The primary water quality pollutant that would need to be controlled throughout the entire project corridor would be sediment. Aside from sediment, construction of the Preferred Alternative has the potential to encounter other pollutants of concern, including hazardous and nonhazardous wastes. The Preferred Alternative would disturb more than 1 acre of soil and will therefore need to comply with the Construction General Permit (CGP) (HYD-IAMF#3). Potential temporary impacts on water quality from soil disturbance and in-water and over-water construction activities, as well as the use, storage, and disposal of construction materials and wastes will be avoided or minimized by implementing a stormwater pollution prevention plan and standard BMPs recommended for a particular construction activity.

Minimizing areas of disturbed soil, especially with erosive soil types and geological deposits, only disturbing areas that may be stabilized before the onset of winter rains, not performing grading or earthwork during the wet months or storm events, and protecting disturbed soil areas with temporary erosion and sediment control BMPs will minimize the potential for water quality impacts during construction (GEO-IAMF#1, GEO-IAMF#10).

Temporary erosion and sediment control measures will be applied to all inactive disturbed soil areas during construction. Other methods of minimizing erosion include preserving existing vegetation and avoiding sensitive wetland and riparian habitats to the extent feasible, which will be documented in a BRMP (BIO-IAMF#5). Additionally, the stormwater pollution prevention plan will specify the installation of replacement plantings or application of a seed mix to assist in permanently stabilizing exposed soils. Wind erosion resulting in fugitive dust emissions will be avoided or minimized through standard construction site BMPs, such as construction roadway speed limits, halting activities during windy conditions, and dust suppression by wetting disturbed soil areas (AQ-IAMF#1).

The Authority will minimize hazardous substances required for construction by using an environmental management system to replace hazardous materials with nonhazardous alternatives to the extent possible (HMW-IAMF#9). Alternative materials will be evaluated on an annual basis. Any hazardous materials used during construction will be stored according to state and federal regulations (HMW-IAMF#10). BMPs to minimize the potential for accidental spills and procedures to mitigate spills will be documented in the spill prevention, control, and countermeasure plans (HMW-IAMF#6) that will be implemented at all project facilities. The construction contractor will prepare a hazardous materials and waste plan that describes responsible parties and procedures for managing hazardous waste and transporting hazardous materials on public roadways (HMW-IAMF#7).

Construction activities could result in waste liquids other than stormwater (i.e., nonstormwater). These may include equipment and vehicle wash water, accidental spills of petroleum

hydrocarbons (e.g., fuels, lubricating oils), concrete wastewater, sanitary wastes from construction worksite wash facilities, contaminated soil, and hazardous materials and waste. Nonstormwater and waste management BMPs, good housekeeping practices, and adhering to CGP conditions for the storage of hazardous materials will avoid or minimize the potential for discharging construction materials and wastes into receiving waters (HMW-IAMF#8).

Construction activities for the East Brisbane LMF will also comply with regulations that control the transport, use, and storage of hazardous materials and minimize the potential for an accidental release of hazardous materials (HMW-IAMF#7, HMW-IAMF#8). Together, these IAMFs and applicable regulations minimize the potential for accidental releases during the transport of hazardous materials and wastes within the construction site and on off-site public roadways by establishing procedures and policies for the proper handling, labeling, packaging, and transportation of these materials.

Additionally, the Authority will minimize the types of hazardous substances required for construction by using an environmental management system to replace hazardous materials with nonhazardous alternatives to the extent possible (HMW-IAMF#9). If required for construction, hazardous materials will be stored according to state and federal regulations (HMW-IAMF#10). BMPs to minimize the potential for accidental spills and procedures to mitigate spills will be documented in the spill prevention, control, and countermeasure plans (HMW-IAMF#6) that will be implemented at all project facilities. The construction contractor will prepare a hazardous materials and waste plan for Authority review and approval that describes responsible parties and procedures for hazardous waste and the transport of hazardous materials on public roadways (HMW-IAMF#7).

As described in Section 3.8, Hydrology and Water Resources, of the Final EIR/EIS, groundwater within the existing Caltrain corridor and the proposed East Brisbane LMF site is reported to contain contaminants. Nonstormwater and waste management BMPs would be critical for avoiding substantial surface-water quality impacts during construction activities that may encounter groundwater in these areas. If large quantities of contaminated groundwater are expected to be encountered, the contractor may elect to use an active treatment system in accordance with the CGP (HYD-IAMF#3).

The contractor will prepare demolition plans for the safe dismantling and removal of waste materials (HMW-IAMF#5). For bridges and other structures near water, the demolition plans will include temporary structures and systems to collect and contain falling debris, including lead-based paint and asbestos-containing materials, and prevent them from entering receiving waters as needed. This project feature will provide measures to collect and contain construction materials, debris, and other toxic substances and prevent them from entering aquatic resources.

In-water and over-water construction activities would be required. In addition to potentially exposing receiving waters to construction equipment, materials, and debris, these activities may require dewatering for excavations or temporary stream diversion, or both. Temporary stream diversions and dewatering would be required to modify a portion of the existing aquatic resource crossing structures. With project features, temporary stream diversions and dewatering would create minimal increases in turbidity and suspended sediment concentrations in receiving waters.

Construction of the Preferred Alternative would require work in waterbodies to build new bridges and culverts as well as realign and relocate aquatic resources (Authority 2022a: Table 3.8-15 and Table 3.8-17). Work in aquatic resources would result in temporary disturbance of the beds and banks of aquatic resources, leading to increased erosion and sedimentation and the exposure of construction materials, equipment, and wastes to receiving waters. Work in perennial aquatic resources would require temporary stream diversion and channel dewatering to allow work on a dry ground surface. Intermittent or ephemeral waterbodies would not likely contain flowing or standing water during summer when construction in waterbodies is anticipated to occur and would not require temporary stream diversion and dewatering. However, erosion and sedimentation would occur in all waterbodies directly disturbed by construction activities when flows occur during winter.

Even with incorporation of these IAMFs, project construction would result in temporary impacts on surface water quality. This impact is significant under CEQA (Authority 2022a: page 3.8-66).

The following measures mitigate this impact: BIO-MM#1, BIO-MM#3, BIO-MM#4, BIO-MM#13, BIO-MM#14, BIO-MM#36, and BIO-MM#37.

The Authority will implement mitigation measures to reduce temporary impacts on water quality resulting from erosion and sedimentation in waterbodies as well as potential increases in water temperature and decreases in dissolved oxygen. BIO-MM#1 involves preparation of an RRP that will identify and describe procedures for restoring temporarily disturbed habitat to its former state. BIO-MM#3 requires the project biologist to establish ESAs and nondisturbance zones that contain aquatic resources to reduce impacts on water quality prior to ground-disturbing activity. BIO-MM#4 requires the project biologist to monitor construction activities that occur within or adjacent to aquatic resources and document compliance with applicable avoidance and minimization measures, including measures set forth in regulatory authorizations issued under the CWA or Porter-Cologne Act. BIO-MM#13 requires contractors to begin revegetation of temporarily affected riparian areas within 90 days of completing construction. BIO-MM#14 requires the Authority to prepare a dewatering plan that incorporates measures to minimize turbidity and siltation of downstream waters. BIO-MM#36 minimizes temporary impacts on aquatic resources by requiring contractors to begin restoration of temporarily disturbed features within 90 days of completing construction. BIO-MM#37 requires preparation and implementation of a CMP for impacts on waters of the U.S. regulated under the federal CWA and waters of the state under the Porter-Cologne Act. These measures are expected to avoid or minimize temporary impacts on receiving water quality resulting from the conversion or loss of aquatic resources and riparian habitat. These mitigation measures will be effective in minimizing construction impacts to surface water quality.

The Authority finds that BIO-MM#1, BIO-MM#3, BIO-MM#4, BIO-MM#13, BIO-MM#14, BIO-MM#36, and BIO-MM#37 are required under the Preferred Alternative and that these mitigation measures will reduce impacts to surface water quality to a less-than-significant level.

4.5.2 Impact HYD#5: Permanent Impacts on Surface Water Quality

Construction of the Preferred Alternative would add impervious surfaces; realign, fill, or modify waterbodies; as well as remove riparian vegetation in the RSA. Prior to construction, the contractor will prepare a stormwater management and treatment plan, which will include permanent stormwater treatment BMPs to reduce the quantity and improve the quality of runoff. However, the Preferred Alternative would result in permanent impacts on water quality through direct removal, filling, hydrological interruption, and other indirect impacts on aquatic resources, as well as the permanent conversion or removal of riparian vegetation.

Prior to construction, the contractor will prepare a stormwater management and treatment plan for Authority review and approval prior to construction (HYD-IAMF#1). The plan will include permanent stormwater BMPs to reduce the quantity and improve the quality of stormwater runoff (treatment and low-impact development measures) and retain flows to prevent increases in flow rates and durations above pre-project conditions (hydromodification management). BMPs would be sized to manage the expected runoff from impervious surfaces. The design of stormwater BMPs within drainage areas connected with local drainage systems will comply with the local agency's municipal separate storm sewer system permit and associated technical guidance. With a stormwater management and treatment plan (HYD-IAMF#1) and long-term maintenance plan for permanent stormwater treatment BMPs, stormwater runoff from new and replaced impervious surfaces, including those in areas with converted land uses, will be collected and discharged in a manner that will not produce excessive erosion or come into contact with pollutant-generating activities.

Even with incorporation of these IAMFs, project construction would result in permanent impacts on surface water quality. This impact is significant under CEQA (Authority 2022a: page 3.8-69).

The following measures mitigate this impact: BIO-MM#35 and BIO-MM#37.

The Authority will implement mitigation measures to reduce permanent impacts on water quality resulting from the realignment, filling, or modification of waterbodies as well as the removal of riparian vegetation. BIO-MM#35 identifies minimum compensatory mitigation requirements for riparian habitat. BIO-MM#37 requires preparation and implementation of a CMP for both temporary and permanent impacts on aquatic resources. Together, these measures are expected to compensate for permanent impacts on receiving water quality resulting from the conversion or loss aquatic resources. These mitigation measures will be effective in minimizing permanent construction impacts to surface water quality.

The Authority finds that BIO-MM#35 and BIO-MM#37 are required under the Preferred Alternative and that these mitigation measures will reduce impacts to surface water quality to a less-than-significant level.

4.6 Hazardous Materials and Wastes (Section 3.10 of the Final EIR/EIS)

The Preferred Alternative would result in potentially significant intermittent impacts from hazardous materials and wastes activities near schools during construction. This potentially significant impact would be mitigated to less than significant.

4.6.1 Impact HMW#13: Intermittent Direct Impacts from Hazardous Material and Waste Activities near Schools during Construction

The impact from the use of hazardous materials and wastes near schools from construction of the Preferred Alternative would be potentially significant under CEQA. Potential impacts include exposure of students and school faculty to hazardous materials or wastes through skin contact, ingestion, or inhalation and environmental impacts on school grounds through contact with released hazardous materials or wastes. Materials are anticipated to be used in a manner consistent with typical construction procedures and are not anticipated to leave the project footprint.

The Preferred Alternative incorporates project features requiring management plans to transport and prevent spills of hazardous materials associated with project construction. During project construction and operations, hazardous materials will be transported in accordance with regulations regarding the transport, use, and storage of hazardous materials (HMW-IAMF#7) with the goal of minimizing the potential for a release of hazardous materials (HMW-IAMF#6) to minimize potential impacts on schools. Any hazardous material use within the project footprint will be subject to federal, state, and local regulations, such as the Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation and Liability Act; the Hazardous Materials Release Response Plans and Inventory Law; and the Hazardous Waste Control Act. These regulations would apply equally near school sites and require monitoring the generation, transportation, treatment, storage, and disposal of hazardous waste. Prior to construction that involves demolition, the contractor will prepare demolition plans for the safe dismantling and removal of building components and debris. The demolition plans will include a plan for lead and asbestos abatement (HMW-IAMF#5). Prior to construction, the contractor will provide the Authority with a hazardous materials and waste plan describing responsible parties and procedures for hazardous materials transport, containment, and storage BMPs that will be implemented during construction (HMW-IAMF#8). Hazardous materials will be stored during project construction primarily at construction staging areas, and during project operations primarily at the Brisbane LMF. Hazardous materials business plans (HMBP) (HMW-IAMF#10) and spill prevention and response plans (HMW-IAMF#6) will be prepared for safe storage of hazardous materials and to manage any spill of stored materials. Proper implementation of the materials storage procedures, as outlined in the HMBP, should limit the extent of any spilled material within a storage area to that storage facility. Further, the contractor will develop environmental management plans to identify, track, and document the locations of hazardous materials and to promote proper handling, storage, and transport of hazardous materials (HMW-IAMF#9). California Public Resources Code (Cal. Public Res. Code) Section 21151.4 states that the Authority must consult the school districts associated with the schools within 0.25 mile of the project prior to EIR certification and notify them of the proposed certification in writing at least 30

days prior. Accordingly, the Authority would give the affected schools opportunity to comment on the project and express any related concerns that may result in potential prescriptive actions, such as limits on the materials used, or restrictions on the transport and storage of such materials. The selection of materials will be aided by an environmental management system (HMW-IAMF#9), which will inventory and evaluate proposed materials, in order to minimize the amount of hazardous materials and to make substitutions for less hazardous materials where possible. The Authority has coordinated with potentially affected school districts during preparation of the environmental document.

However, although IAMFs require that materials be selected to minimize potential impacts on the public and the environment and that HMBPs and environmental management plans be used to track and document the location and types of hazardous materials used to verify that they are properly stored and transported, these IAMFs would not eliminate the possibility of a release of hazardous materials in quantities greater than the state threshold quantity given in subdivision (l) of Section 25532 of the Health and Safety Code near schools within 0.25 mile of the project footprint. This impact is significant under CEQA (Authority 2022a: page 3.10-48).

The following measure mitigates this impact: HMW-MM#1: Limit Use of Extremely Hazardous Materials Near Schools during Construction.

The Authority will implement HMW-MM#1 to reduce the potential for a release of hazardous materials near schools during construction. HMW-MM#1 requires that prior to construction, the contractor prepare a memorandum regarding hazardous materials BMPs related to construction activity for approval by the Authority. The memorandum will confirm that the contractor will not handle or store an extremely hazardous substance (as defined in Cal. Public Res. Code § 21151.4) or a mixture containing extremely hazardous substances in a quantity equal to or greater than the state threshold quantity specified pursuant to subdivision (j) of Section 25532 of the Health and Safety Code within 0.25 mile of a school. The memorandum will acknowledge that prior to construction activities, signage will be installed to delimit all work areas within 0.25 mile of a school, informing the contractor not to bring extremely hazardous substances into the area. The contractor is required to monitor all use of extremely hazardous substances. The mitigation measure is consistent with Cal. Public Res. Code Section 21151.4. The memorandum will be submitted to the Authority prior to any construction involving an extremely hazardous substance.

This mitigation measure will be effective because it will reduce the quantities of extremely hazardous materials used near schools during project construction to below the state threshold quantity given in subdivision (l) of Section 25532 of the Health and Safety Code.

The Authority finds that HMW-MM#1 is required under the Preferred Alternative and that this mitigation measure will reduce impacts from hazardous wastes and materials near schools to a less-than-significant level.

4.7 Safety and Security (Section 3.11 of the Final EIR/EIS)

The Preferred Alternative would result in potentially significant permanent impacts on emergency access and response times. The potentially significant impact on emergency access and response times would remain significant and unavoidable even with mitigation.

4.7.1 Impact S&S#6: Continuous Permanent Impacts on Emergency Access and Response Times due to Station Traffic and Increased Gate-Down Time

Operation of the Preferred Alternative would result in increased emergency vehicle response times because of gate-down events caused by HSR trains. The following areas would be affected: Burlingame east of rail corridor between Oak Grove Avenue and Howard Avenue, Redwood City west of rail corridor between Whipple Avenue and Broadway, Menlo Park east of rail corridor centered on Ravenswood Avenue and Oak Grove Avenue, Menlo Park/Palo Alto west of rail corridor along city boundaries just north of San Hill Road, and Mountain View west of rail corridor centered in Rengstorff Avenue. In addition, the Preferred Alternative would result in increased travel time because of increased HSR station and LMF traffic. The following areas

would be affected: Fire Station 8 in San Francisco near the 4th and King Street Station, Fire Station 37 in Millbrae near the Millbrae Station, and San Francisco Station 44 near the Brisbane LMF.¹⁰ This increased travel time for emergency response vehicles would be considered a significant impact under CEQA (Authority 2022a: page 3.11-87).

The following measures mitigate this impact: SS-MM#3: Install Emergency Vehicle Priority Treatments near HSR Stations; SS-MM#4: Install Emergency Vehicle Priority Treatments Related to Increased Gate-Down Time Impacts; installing traffic signals under TR-MM#1a.2: North Lane/California Drive—Install Traffic Signal, TR-MM#1a.3: North Lane/Carolan Avenue—Install Traffic Signal, and TR-MM#1a.5: Brewster Avenue/Perry Street—Install Traffic Signal; adding overlap signal phase and optimizing signal timing under TR-MM#1h: Whipple Avenue/Arguello Street—Add Overlap Signal Phase and Optimize Signal Timing; and optimizing signal timing under TR-MM#1i: Whipple Avenue/Arguello Street—Optimize Signal Timing.¹⁰

The Authority will implement these mitigation measures to reduce impacts on emergency vehicle response times. These mitigation measures will reduce emergency vehicle response times by monitoring at-grade crossing conditions and providing a fair share contribution to emergency vehicle response improvements on key routes that serve affected fire stations/first responders as needed. These mitigation measures will fully mitigate the project's impacts on emergency vehicle response if implemented. Although the Authority can provide funding for the construction of emergency vehicle response improvements, it cannot compel the City of Burlingame, City of Redwood City, City of Menlo Park, City of Palo Alto, and City of Mountain View to construct and operate the improvements.

The Authority finds that SS-MM#3, SS-MM#4, TR-MM#1a.2, TR-MM#1a.3, TR-MM#1a.5, TR-MM#1h, and TR-MM#1i are required under the Preferred Alternative; however, because the Authority cannot compel the construction and operation of the improvements as discussed above, the CEQA impact on emergency vehicle response time would remain significant and unavoidable. The Authority finds that there are no other feasible mitigation measures or alternatives that could be adopted to reduce this remaining impact to less-than-significant levels. The Authority finds that despite this otherwise significant and unavoidable impact, specific economic, social, and other considerations identified in the Statement of Overriding Considerations (Chapter 8) support certification of the Final EIR/EIS and approval of the project.

4.8 Station Planning, Land Use, and Development (Section 3.13 in the Final EIR/EIS)

Construction of the Preferred Alternative would result in potentially significant permanent impacts related to alteration of land use patterns from land use conversion at stations and the Brisbane LMF, permanent impacts related to alteration of land use patterns from project operations, and conflicts with BCDC shoreline band policies. The potentially significant impacts under the Preferred Alternative related to alteration of land use patterns from land use conversion at stations and the Brisbane LMF would remain significant and unavoidable, while the potentially significant impacts related to permanent alteration of land use patterns from project operations, and conflicts with BCDC shoreline band policies would be mitigated to less than significant.

These findings address impacts associated with the Preferred Alternative. Because of length, the full mitigation measure text is presented separately in Attachment A to these CEQA findings. As explained in the Final EIR/EIS, with implementation of LU-MM#2, there may be

¹⁰ Additional emergency response impacts would occur under Alternative A within the San Jose Diridon Station Approach Subsection, affecting San Jose Fire Station 1 and San Jose Fire Station 30. Mitigation measures would be available to reduce these impacts. These impacts and mitigation measures are included in the Final EIR/EIS but are not included in these findings because the San Jose Diridon Station Approach Subsection was approved by the Authority Board of Directors as part of the San Jose to Merced Project Section in April 2022.

limited disturbance of prior landfill materials; all relevant construction controls for work within the landfill for the project will apply to trail construction under LU-MM#2.

4.8.1 Impact LU#4: Permanent Alteration of Land Use Patterns from Land Use Conversion and Introduction of Incompatible Uses at Stations

The HSR modifications to Millbrae Station would require permanent conversion of 7.8 acres under the Preferred Alternative. Construction of the Millbrae Station modifications would result in a substantial, significant change in existing land uses due to the commercial uses being converted to transportation uses.¹¹ Construction of the Millbrae Station modifications would also result in a substantial, significant change in planned land use patterns by conflicting with the planned Millbrae Serra Station Development project. This alteration and conversion of existing and planned land uses at stations would be considered a significant impact under CEQA (Authority 2022a: page 3.13-61).

The Authority finds that there are no feasible mitigation measures or alternatives that could be adopted to reduce the impact of construction of the Millbrae Station on existing and planned land uses. The Authority finds that despite this significant and unavoidable impact, specific economic, social, and other considerations identified in the Statement of Overriding Considerations (Chapter 8) support certification of the Final EIR/EIS and approval of the project.

4.8.2 Impact LU#5: Permanent Alteration of Land Use Patterns from Land Use Conversion at the Brisbane Light Maintenance Facility

Construction of the East Brisbane LMF under the Preferred Alternative would require the permanent acquisition of lands designated as planned development (residential prohibited). The Authority will continue ongoing coordination with the City of Brisbane and the developers for the Brisbane Baylands in order to minimize potential incompatibilities between the Brisbane LMF and the planned development for the Brisbane Baylands. The alteration and conversion of planned land uses at the Brisbane LMF would be considered a significant impact under CEQA (Authority 2022a: page 3.13-66).

The Authority finds that there are no feasible mitigation measures or alternatives available that would reduce the impact of construction of the East Brisbane LMF on planned land uses. The Authority finds that despite this significant and unavoidable impact, specific economic, social, and other considerations identified in the Statement of Overriding Considerations (Chapter 8) support certification of the Final EIR/EIS and approval of the project.

4.8.3 Impact LU#6: Permanent Alteration of Land Use Patterns from Increased Noise, Light, and Glare

Operation of the Preferred Alternative would increase noise levels above the conditionally acceptable noise limits established in the Brisbane General Plan. Increased train service and operation of the East Brisbane LMF would introduce a new source of nighttime noise that would affect areas designated for planned development at the Brisbane Baylands site, including planned development (residential prohibited). The conservatively estimated noise levels would exceed both the normally acceptable and conditional acceptable noise levels for residential and commercial uses per the Brisbane General Plan. In addition, it could result in a change in planned land use patterns by pushing planned development further out from the mainline track alignments. Operations of the project could result in alteration of land use patterns in Brisbane as a result of increased noise, light, and glare, which is considered a significant impact under CEQA (Authority 2022a: page 3.13-70).

The following measure mitigates this impact: LU-MM#1: Implement Noise Mitigation in Conjunction with Land Use Development in Brisbane.

¹¹ Refer to Section 6.1.2.2, Millbrae Reduced Site Plan Design Variant, for discussion of the design variant for the Millbrae Station that is not proposed for approval as part of the Preferred Alternative.

The Authority will implement LU-MM#1 to reduce noise impacts and potential changes in land use patterns in Brisbane by constructing noise barriers and installing building sound insulation. This mitigation measure will be effective in minimizing the project’s impacts on land use patterns in Brisbane associated with increased noise, light, and glare.

The Authority finds that LU-MM#1 is required under the Preferred Alternative and that this mitigation measure will reduce the project’s impacts on land use patterns in Brisbane to a less-than-significant level.

4.8.4 Impact LU#7: Conflict with BCDC Shoreline Band Policies

Construction of the Preferred Alternative on BCDC’s shoreline band would be inconsistent with the San Francisco Bay Plan’s policies because project components do not include measures to maximize, to the extent feasible, public access to the Bay or shoreline. The Preferred Alternative would be located on the shoreline bands of Guadalupe Valley Creek and on the shoreline band of Visitacion Creek. This conflict with BCDC’s shoreline band policies is considered significant under CEQA (Authority 2022a: page 3.13-74).

The following measure mitigates this impact: LU-MM#2: Shoreline Access Improvements in Brisbane.

The Authority will implement LU-MM#2 that includes construction of a new bicycle/pedestrian trail that will maximize public access to Brisbane Lagoon and San Francisco Bay. This mitigation measure will result in a net increase in public access, relative to existing conditions consistent with the BCDC San Francisco Bay Plan. The Authority finds that LU-MM#2 is required under the Preferred Alternative and that this mitigation measure will reduce the project’s impacts on BCDC’s shoreline band to a less-than-significant level.

4.9 Cultural Resources (Section 3.16 of the Final EIR/EIS)

The Preferred Alternative would result in potentially significant impacts associated with permanent disturbance of both known and unknown archaeological sites.¹² Impacts on known and unknown archaeological sites would be mitigated to less than significant.

These findings address impacts associated with the Preferred Alternative. Because of length, the full mitigation measure text is presented separately in Attachment A to these CEQA findings.

4.9.1 Impact CUL#1: Permanent Disturbance of Unknown Archaeological Resources

Construction of the Preferred Alternative could potentially affect unknown archaeological resources, including buried archaeological deposits, through ground-disturbing activities. Unknown archaeological resources might encompass the full range of pre-contact or historic-period activities conducted over time, including pre-contact lithic scatters and village sites, historic-period homestead remains, and human burials. Unknown or unrecorded archaeological resources that are not observable when conducting standard surface archaeological inspections, including subsurface buried archaeological deposits, may exist in urbanized and suburban areas, although most ground-disturbing activities would take place within an existing, disturbed Caltrain right-of-way; therefore, the potential for archaeological resources at or near the ground surface at these locations is anticipated to be low. Unknown or unrecorded archaeological resources may also exist in areas where permission to enter has not been granted. Construction staff will be trained in identifying cultural resources (CUL-IAMF#2). Pre-construction phased identification

¹² The Final EIR/EIS includes an additional significant impact (Impact CUL#4: Permanent Demolition, Destruction, Relocation, or Alteration of Built Resources or Setting) that would occur under Alternative A only within the San Jose Diridon Station Approach Subsection. This impact is not included in these findings because the San Jose Diridon Station Approach Subsection was approved by the Authority Board of Directors as part of the San Jose to Merced Project Section in April 2022.

surveys will take place as parcel access is acquired (CUL-IAMF#3). Damaging or destroying an archaeological site reduces the site's integrity, and reduces or eliminates the site's ability to provide important scientific information, which diminishes the site's integrity. Accordingly, impacts associated with disturbance of unknown archaeological resources would be considered a significant impact under CEQA (Authority 2022a: page 3.16-47).

The Authority will limit potential impacts on unknown archaeological resources by developing a memorandum of agreement (MOA) for each undertaking where it is determined that there would be an adverse effect on historic properties or when phased identification is necessary and impacts would occur. The Authority and the State Historic Preservation Officer (SHPO) will use the MOA to enforce the required actions arising from the Section 106 consultation.

The following measures mitigate this impact: CUL-MM#1: Mitigate Adverse Effects on Archaeological and Built Resources Identified during Phased Identification and Comply with the Stipulations Regarding the Treatment of Archaeological and Historic Built Resources in the PA and MOA; CUL-MM#2: Halt Work in the Event of an Archaeological Discovery, and Comply with the PA, MOA, ATP, and all State and Federal Laws, as Applicable; and CUL-MM#3: Other Mitigation for Effects on NRHP-Eligible Pre-Contact Archaeological Resources.

The Authority will implement mitigation measures to minimize the impacts on unknown archaeological resources. CUL-MM#1 requires mitigation of significant impacts on sites found during these surveys, including site avoidance if feasible, evaluation, and data recovery if necessary. CUL-MM#2 specifies procedures and protocols to be followed in the event of unanticipated discoveries during construction, including stopping work, preservation of the discovery until evaluated by a qualified archaeologist, and treatment of human remains as required by law. CUL-MM#3 requires consultation efforts to develop meaningful mitigation measures for impacts on as-yet-unidentified Native American archaeological resources that cannot be avoided to be negotiated with the tribal consulting parties.

These mitigation measures will reduce the impacts on unknown archaeological resources during project construction.

The Authority finds that CUL-MM#1, CUL-MM#2, and CUL-MM#3 are required under the Preferred Alternative and that these mitigation measures will reduce impacts associated with disturbance of unknown archaeological sites to a less-than-significant level.

4.9.2 Impact CUL#2: Permanent Disturbance of Known Archaeological Sites

The Preferred Alternative would cross all or part of 21 known archaeological resources in the project footprint.¹³ These cultural resources would be subject to phased evaluation, and they are assumed eligible until they can be evaluated and their eligibility determined. Grading, trenching, and excavating in the project footprint during construction, as well as compaction resulting from the use of heavy machinery and other vehicular traffic on the construction site or in TCEs, may affect the integrity of artifact-bearing archaeological deposits. Project features will help reduce this impact through archaeological resource mapping of known sites, allowing their avoidance; pre-construction surveys; training of workers to identify cultural resources and avoid damaging them; and implementing the archaeological monitoring plan (CUL-IAMF#1, CUL-IAMF#2, CUL-IAMF#3, and CUL-IAMF#5). However, even with these IAMFs, permanent disturbance of known archaeological sites would still occur and would be considered a significant impact under CEQA (Authority 2022a: pages 3.16-48 to 3.16-56).

The following measures mitigate this impact: CUL-MM#1, CUL-MM#2, and CUL-MM#3.

¹³ Six additional known archaeological resources are within the project footprint of Alternative A in the San Jose Diridon Station Approach Subsection. Impacts on these resources are included in the Final EIR/EIS but are not included in these findings because the San Jose Diridon Station Approach Subsection was approved by the Authority Board of Directors as part of the San Jose to Merced Project Section in April 2022.

The Authority will survey areas prior to work (CUL-MM#1) and implement the archaeological treatment plan (ATP) (CUL-MM#2), which provides specific performance standards so that each impact will be avoided, minimized, or mitigated to the extent possible and provide enforceable performance standards to follow the National Register of Historic Places (NRHP) and the Secretary of the Interior's standards when implementing the mitigation measures. Specifically, the ATP will focus on the treatment of known and unknown archaeological resources, and will require phased identification, evaluation, and mitigation of archaeological resources determined eligible and located in the area of potential effects. In addition, the Authority will implement CUL-MM#3. The mitigation measures will reduce or eliminate impacts on known archaeological resources.

The Authority finds that CUL-MM#1, CUL-MM#2, and CUL-MM#3 are required under the Preferred Alternative and that these mitigation measures will reduce impacts associated with permanent disturbance of known archaeological sites to a less-than-significant level.

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5 CUMULATIVE IMPACTS (SECTION 3.18 OF THE FINAL EIR/EIS)

This chapter presents the Authority's findings regarding the cumulative impacts from implementing the Preferred Alternative in combination with other closely related past, present, and reasonably foreseeable future projects. CEQA defines cumulative impacts as two or more individual impacts that, when evaluated together, are considerable or capable of compounding or increasing other environmental impacts (CEQA Guidelines § 15355). Under CEQA, when a project would contribute to a significant cumulative impact, an EIR must discuss whether the project's incremental effect would be "cumulatively considerable." Cumulatively considerable means that the project's incremental effect would be significant when viewed in the context of past, present, and reasonably foreseeable projects (cumulative projects) that contribute to the cumulative impact. The discussion of cumulative impacts need not provide as much detail as that provided for the effects attributable to the project alone (CEQA Guidelines § 15130(b)). As described in the Final EIR/EIS, the focus of the cumulative impacts analysis is on the Preferred Alternative and the regional context appropriate for each resource area, including adjacent sections of the California HSR System.

As presented in the Final EIR/EIS, Section 3.18, Cumulative Impacts, the analysis concludes that cumulative impacts are less than significant under CEQA for the following subject areas: electromagnetic fields/electromagnetic interference; public utilities and energy; hydrology and water resources; hazardous materials and wastes; socioeconomic and communities; station planning, land use, and development; parks, recreation, and open space; and archaeological resources. Because the overall cumulative impact in each of these subject areas is determined to be less than significant, as described in Section 3.18, the project cannot contribute to a significant cumulative impact and therefore the project contributions are less than significant. Consequently, these subjects are not discussed further below as the discussion focused on significant cumulative impacts to which the project would contribute.

5.1 Transportation

Construction of cumulative projects would result in a potentially significant cumulative impact on passenger and freight rail service because track closures and other construction activities would disrupt or interfere with expanded passenger and freight operations. Disruption of passenger rail and freight rail service and potential diversion of commuter rail riders as well as freight shipments to alternative modes of travel or transport during construction is considered a significant cumulative impact. However, construction of the Preferred Alternative would not contribute to this cumulative impact because the Authority will implement TR-MM#3 (Section 4.1, Transportation (Section 3.2 of the Final EIR/EIS)), which includes effective measures to minimize potential delays of passenger and freight rail service during construction. With this mitigation measure, the contribution of the Preferred Alternative to cumulative impacts on passenger and freight rail service will be reduced and not be cumulatively considerable.

Operation of cumulative projects would result in significant cumulative impacts on bus transit service performance because of added vehicle traffic in station areas and increased gate-down time at at-grade crossings which would lead to delays and effects on on-time performance. The Preferred Alternative's contribution to this significant cumulative impact would be considerable because even after implementation of TR-MM#2 (Section 4.1), the overall performance of the network would remain below the identified service standards for several high-frequency bus routes in San Francisco. No additional mitigation is available to reduce the cumulative impact other than TR-MM#2 already identified as required under the Preferred Alternative in Section 4.1 of this document. Therefore, the incremental effect of the operations of the Preferred Alternative would be cumulatively considerable for bus transit, and remain significant and unavoidable.

Operation of cumulative projects would result in significant cumulative impacts on pedestrian facility capacity at the 4th and King Street Station. The project would contribute to a cumulative impact due to the effect of additional HSR riders on the pedestrian frontage at the 4th and King Street Station. However, construction of the Preferred Alternative would not contribute to this cumulative impact because the Authority will implement TR-MM#5 (Section 4.1), which will

increase sidewalk capacity along the Fourth Street station frontage between Townsend Street and King Street and will address the project's contribution to pedestrian impacts associated with new pedestrian trips generated by HSR. With this mitigation, the contribution of the Preferred Alternative to cumulative impacts on pedestrian facility capacity at the 4th and King Street Station would be reduced and not be cumulatively considerable.

The Authority finds that transportation mitigation measures have been incorporated into the Preferred Alternative (Section 4.1) and that these mitigation measures reduce the Preferred Alternative's impacts to a less than cumulatively considerable level except for permanent impacts on bus transit service performance. The Authority finds that there are no other feasible mitigation measures or alternatives that will reduce this operations-related impact on bus transit to a less-than-cumulatively-considerable level. To the extent that this cumulatively considerable adverse impact remains significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations (Chapter 8) support certification of the Final EIR/EIS and approval of the project.

5.2 Air Quality and Greenhouse Gases

Construction of the Preferred Alternative, in combination with cumulative projects in the cumulative RSA, would result in a significant regional cumulative impact for NO_x because construction activities would exceed air district thresholds. The Preferred Alternative's contribution to this significant cumulative impact would not be cumulatively considerable because purchase of offsets through project-level mitigation (AQ-MM#2, Section 4.2, Air Quality and Greenhouse Gases (Section 3.3 of the Final EIR/EIS)) would offset NO_x emissions to below air district thresholds or net zero. Therefore, CEQA does not require any further mitigation.

Construction of the Preferred Alternative, in combination with cumulative projects in the cumulative RSA, would result in a significant cumulative impact to localized PM_{2.5} and PM₁₀ concentrations. The Preferred Alternative's contribution to this significant cumulative impact would be cumulatively considerable because of new or worsened violations of the ambient air quality standards even after all feasible mitigation. No further mitigation is available to address this cumulative impact other than the measures incorporated into the Preferred Alternative as identified in Section 4.2 of this document. Therefore, the incremental effect of construction of the Preferred Alternative would be cumulatively considerable for localized PM_{2.5} and PM₁₀ emissions, and significant and unavoidable.

The combined effects of the electrified passenger rail service, displacement of vehicle miles traveled (VMT) and air travel, and motor vehicle and stationary source turnover represent the new emissions paradigm to which receptors would be exposed. Although there are areas of the RSA with greater existing health risks, the addition of HSR service would achieve health risk reductions in the RSA, constituting a localized air quality benefit. Nevertheless, combined total cumulative cancer risks and noncancer impacts on sensitive receptors near the project footprint would exceed the BAAQMD's thresholds, resulting in a significant cumulative impact. The project's contribution to this cumulative impact during construction would be cumulatively considerable. Although no feasible mitigation measures are known at this time, the Authority will coordinate with BAAQMD to identify if there are feasible additional measures consistent with the HSR project that may lower some of the cumulative health risks in areas with existing cumulative health risks above cumulative thresholds and where the HSR project would contribute in a limited way to those risks. This may result in lowering of some of the cumulative health risks identified, but the feasibility and effectiveness of any such measures are unknown at this time and not presumed for the purposes of CEQA determinations. Therefore, the incremental effect of operations for the Preferred Alternative would be cumulatively considerable for total cumulative cancer risks and noncancer impacts on sensitive receptors, and significant and unavoidable.

Past, present, and future projects cumulatively contribute to nonattainment of the NAAQS and CAAQS in the SFBAAB. Emission reductions achieved during HSR project operations, however, would help improve regional air quality and cumulative air quality conditions, resulting in a beneficial effect. Accordingly, CEQA does not require mitigation.

Project operations, in combination with cumulative projects in the cumulative RSA, would result in a local significant cumulative impact with respect to local PM_{2.5} because local concentrations at sensitive receptors near operation of freight trains on shifted track would exceed the BAAQMD's threshold. The project's contribution to this significant cumulative impact would not be cumulatively considerable because the PM_{2.5} concentrations with the project would be less than under existing conditions. Accordingly, the freight track shifts would not contribute any additional risk to the existing significant impact. Similarly, the project would not contribute to a new long-term cumulatively considerable impact as health risks from the HSR stations and the LMF, in combination with planned projects in the cumulative RSA, would not exceed the BAAQMD's health risk thresholds. Therefore, CEQA does not require mitigation.

Project construction and operations, in combination with planned projects in the cumulative RSA, would result in a local significant cumulative health impact because local risks and PM_{2.5} concentrations at sensitive receptors would exceed the BAAQMD's thresholds. The project's contribution to this significant cumulative impact would be cumulatively considerable. Although no feasible mitigation measures are known at this time, the Authority will coordinate with BAAQMD to identify if there are feasible additional measures consistent with the HSR project that may lower some of the cumulative health risks in areas with existing cumulative health risks above cumulative thresholds and where the HSR project would contribute in a limited way to those risks. This may result in lowering of some of the cumulative health risks identified, but the feasibility and effectiveness of any such measures are unknown at this time and not presumed for the purposes of CEQA determinations. Therefore, the incremental effect of the Preferred Alternative would be cumulatively considerable for health risks of PM_{2.5} concentrations, and significant and unavoidable.

Past, present, and future projects cumulatively contribute to GHG impacts. Although construction of the Preferred Alternative would result in a temporary increase in GHG emissions, project operations would decrease overall GHG emissions by reducing vehicle and aircraft trips, offsetting the increase in GHG emissions associated with project construction within a few months of operation, and resulting in substantial GHG emissions reductions over the lifetime of the HSR project. Operational GHG impacts would be beneficial because the project would result in a statewide and regional reduction of GHG emissions. Therefore, CEQA does not require mitigation.

The Authority finds that construction air quality mitigation measures have been incorporated into the Preferred Alternative (Section 4.2) and that these mitigation measures reduce the Preferred Alternative's construction emissions to a less-than-cumulatively-considerable level except for localized PM_{2.5} and PM₁₀. The Authority further finds that the CEQA impacts for total cumulative cancer risks and noncancer impacts on sensitive receptors, and health risks of PM_{2.5} concentrations, remain cumulatively considerable. The Authority finds that there are no other feasible mitigation measures or alternatives that will reduce these impacts to a less-than-cumulatively-considerable level. To the extent that these cumulatively considerable adverse impacts remain significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations (Chapter 8) support certification of the Final EIR/EIS and approval of the project.

5.3 Noise and Vibration

Operation of the Preferred Alternative would result in significant cumulative noise impacts under CEQA because noise-sensitive receptors would experience noise levels above existing ambient levels and in exceedance of FRA criteria for severe noise impacts. The Preferred Alternative's contribution to the cumulative impact would be considerable because it would cause the largest change in the baseline ambient noise conditions of the cumulative projects. The Authority will implement mitigation measures (NV-MM#3, NV-MM#5, NV-MM#6, and NV-MM#7; Section 4.3, Noise and Vibration (Section 3.4 of the Final EIR/EIS)) to minimize operations noise impacts. While these mitigation measures will be effective at reducing the number of severe noise impacts in the cumulative RSA, they will not mitigate all cumulative noise impacts. Therefore, the

incremental effect of operations for the Preferred Alternative would be cumulatively considerable for noise impacts, and remain significant and unavoidable.

Operations of the Preferred Alternative, combined with other cumulative projects, would result in a significant cumulative noise impact associated with traffic-related noise increases. The Preferred Alternative would result in increases in traffic-related noise at two roadway segments near the 4th and King Street Station (2029), increasing ambient noise above existing levels by more than 3 dB. The Authority will implement mitigation measures to minimize impacts from traffic noise increases (NV-MM#3 and NV-MM#7; Section 4.3). These mitigation measures will reduce but not eliminate traffic-related cumulative noise impacts. Therefore, the incremental effect of operations for the Preferred Alternative would be cumulatively considerable for noise impacts from traffic-related noise, and remain significant and unavoidable.

During operations, the Preferred Alternative in combination with other cumulative projects would generate a significant cumulative vibration impact under CEQA because vibration levels would exceed acceptable FRA criteria at multiple receptors. The contribution of the project to this cumulative impact would be considerable because it would be the primary contributor to the increases in ground-borne vibration along the corridor. The Authority will implement NV-MM#8 (Section 4.3) to reduce vibration impacts from operations. There are various options to reduce train vibration, though it may not be possible in all instances to mitigate all vibration impacts because it may not be cost effective or acoustically feasible. The specific design and implementation of this mitigation measure would be identified during final design. There is no additional feasible mitigation. Therefore, the incremental effect of operations for the Preferred Alternative would be cumulatively considerable for operational vibration impacts, and significant and unavoidable.

The Authority finds that there are no other feasible mitigation measures that will reduce these impacts to operational noise and operational vibration to a less-than-cumulatively-considerable level. To the extent that these cumulatively considerable adverse impacts remain significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations (Chapter 8) support certification of the Final EIR/EIS and approval of the project.

5.4 Biological and Aquatic Resources

5.4.1 Special-Status Plant and Wildlife Species

Construction and operation of the Preferred Alternative, in combination with cumulative projects, would result in a significant cumulative impact under CEQA with respect to special-status plant and wildlife species because it would contribute to ongoing habitat loss caused by development. The permanent conversion of existing land uses to residential, commercial, agricultural, and transportation uses would result in cumulative impacts on special-status species.

The project's contribution to the significant cumulative impact would not be considerable, however, because extensive mitigation measures, such as species-specific avoidance, minimization, and compensatory mitigation measures (Section 4.4, Biological and Aquatic Resources (Section 3.7 of the Final EIR/EIS)), will reduce the project's contribution to this impact. These measures will offset impacts on special-status species such that the project would not result in a cumulatively considerable contribution to impacts on special-status species.

The Authority therefore finds that mitigation measures have been incorporated in the Preferred Alternative that will reduce the Preferred Alternative's cumulatively considerable construction impact on special-status plant and wildlife species to less than cumulatively considerable.

5.4.2 Non-Special-Status Wildlife

Construction and operation of the Preferred Alternative, in combination with cumulative projects, would result in a significant cumulative impact under CEQA with respect to non-special-status wildlife because their construction would convert or degrade habitat for some species and encourage the expansion of generalist species that have adapted to and thrive in human-

dominated landscapes, often at the expense of other native species. However, the Preferred Alternative's contribution to the significant cumulative impact would not be considerable because these impacts would be minimal compared to the total amount of remaining habitat for native wildlife in the cumulative RSA and would be confined to an area that is dominated by urban development and exposed to ongoing human disturbance. Most non-special-status wildlife species affected by the project alternatives are common and highly adapted to the urban environment. Because the Preferred Alternative would not make a considerable contribution, CEQA does not require mitigation.

5.4.3 Special-Status Plant Communities

Construction and operation of the Preferred Alternative, in combination with cumulative projects, would result in a significant cumulative impact under CEQA with respect to special-status plant communities because they would have a substantial adverse effect, both directly (i.e., causing mortality of individual animals) and through habitat modifications (i.e., conversion or degradation of habitat), on such species. The Preferred Alternative's contribution to this impact would not be considerable, however, because of the low number and limited extent of communities and the small amount affected and because of the offsetting effects associated with adherence to required mitigation measures, including but not limited to BIO-MM#6 and BIO-MM#7 (Section 4.4). These mitigation measures will minimize direct and indirect impacts on habitat for special-status plants and provide for the avoidance or salvage and relocation of special-status plant occurrences in the project footprint. These measures will be effective in minimizing the project's impacts associated with habitat conversion on special-status plants and reducing the project's contribution to this impact.

The Authority therefore finds that mitigation measures have been incorporated in the Preferred Alternative that will reduce the Preferred Alternative's cumulatively considerable construction impact on special-status plant communities to less than cumulatively considerable.

5.4.4 Aquatic Resources

Construction and operation of the Preferred Alternative in combination with other cumulative projects would result in a significant cumulative impact on aquatic resources under CEQA because the cumulative projects would contribute to loss and degradation of wetlands, such as federally protected wetlands as defined by Section 404 of the CWA, throughout the cumulative RSA. The Preferred Alternative's contribution to the significant cumulative impact would not be considerable, however, because of the low habitat quality and limited extent of affected wetlands, as well as the project-level mitigation. Mitigation measures such as BIO-MM#35 and BIO-MM#37 (Section 4.4) will compensate for permanent and temporary impacts by providing for on- or off-site creation, restoration, enhancement, or preservation of "in kind" wetlands or nonwetland waters that provide the same functions and values as those impacted by construction. These mitigation measures will be effective in minimizing the project's impacts associated with conversion or degradation of jurisdictional aquatic resources, and compensate for permanent impacts on aquatic resources. With these mitigation measures, the contribution of the Preferred Alternative to cumulative impacts on aquatic resources will be reduced and not be cumulatively considerable.

The Authority therefore finds that mitigation measures have been incorporated in the Preferred Alternative that will reduce the Preferred Alternative's cumulatively considerable construction impact on aquatic resources to less than cumulatively considerable.

5.4.5 Protected Trees

Construction and operation of the Preferred Alternative in combination with other cumulative projects would result in a significant cumulative impact on protected trees under CEQA because they would conflict with local tree preservation policies or ordinances throughout the cumulative RSA, specifically if construction activities require the removal or trimming of trees protected under local tree protection ordinances. Although the project would result in the removal or trimming of protected trees, the number of such trees is expected to be small because many within the

Caltrain right-of-way will be removed during construction of the Peninsula Corridor Electrification Project (PCEP). Additionally, the Authority will implement BIO-MM#39 (Section 4.4), which requires the project biologist to conduct surveys in the work area to identify protected trees and requires compensatory mitigation for removal of protected trees based on requirements set out in applicable local government ordinances, policies, and regulations. This measure is expected to avoid or compensate for direct impacts on protected trees. With this mitigation, the Preferred Alternative's contribution to the significant cumulative impact would be reduced and not be cumulatively considerable.

The Authority therefore finds that a mitigation measure has been incorporated in the Preferred Alternative that will reduce the Preferred Alternative's impact on protected trees resources to less than cumulatively considerable.

5.4.6 Wildlife Corridors

Construction and operation of the Preferred Alternative in combination with other cumulative projects would result in a significant cumulative impact on wildlife corridors under CEQA because they would interfere substantially with the movement of native wildlife and with established native resident and migratory wildlife corridors. The Preferred Alternative's contribution to the significant cumulative impact would not be considerable, however, because it would not affect any established wildlife corridors and construction impacts on resident wildlife movement across the blended Caltrain/HSR right-of-way would be short-term and temporary. Because the Preferred Alternative would not make a considerable contribution, CEQA does not require mitigation.

5.4.7 Conservation Areas

Construction and operation of the Preferred Alternative in combination with other cumulative projects would result in a significant cumulative impact on habitat conservation plans under CEQA because they would conflict with the provisions of an adopted habitat conservation plan and natural community conservation plan (SCVHP) and local habitat conservation plan (Coyote Valley Landscape Linkages Report). The project would not contribute to the significant cumulative impact, however, because there are no conservation areas that overlap with the project footprint and the portion of the project footprint that overlaps with the SCVHP (County of Santa Clara et al. 2012) and Santa Clara Valley Greenprint (Santa Clara Valley Open Space Authority 2014) would not conflict with any provisions of these plans. Because the Preferred Alternative would not make a considerable contribution, CEQA does not require mitigation.

5.5 Geology, Soils, Seismicity, and Paleontological Resources

The Preferred Alternative, in combination with other cumulative projects, would result in a significant cumulative impact under CEQA with respect to paleontological resources because these actions would have the potential to disturb, damage, or destroy scientifically important fossil resources throughout the cumulative RSA. The Preferred Alternative's contribution to this cumulative impact would not be cumulatively considerable because the project incorporates requirements for monitoring, discovery procedures, and halting construction when resources are found, which would prevent project-related destruction of unique paleontological resources or sites. Because the Preferred Alternative would not make a considerable contribution, CEQA does not require mitigation.

5.6 Safety and Security

The Preferred Alternative, in combination with cumulative projects, would result in a significant cumulative impact under CEQA with respect to emergency response because of permanent delays in emergency vehicle access and response times during project operations. During operations, the Preferred Alternative's contribution to this cumulative impact would be cumulatively considerable because the project would be a substantial contributor toward the degraded intersection operations that would result in increased emergency response times. Although mitigation measures (SS-MM#3, TR-MM#2; Section 4.7, Safety and Security (Section 3.11 of the Final EIR/EIS)) will address some of the intersection delays contributing to increase emergency vehicle response times, increases in emergency response times would continue to

affect emergency responders during construction and in Burlingame, Redwood City, Menlo Park, Palo Alto, and Mountain View during operation. Through an additional mitigation measure (SS-MM#4; Section 4.7), the Authority will provide a fair-share payment towards additional emergency-related improvements in each of these communities. If each community ultimately opts to construct such improvements, the contribution of the Preferred Alternative to this significant cumulative impact would not be considerable. If communities do not opt to construct such improvements, the Authority will implement certain site-specific traffic mitigation measures included in TR-MM#1 (Section 4.7) for intersections at locations of project-related delays to emergency vehicle response delays due to increased gate-down time at certain at-grade crossings. If the mitigation proposed is not adequately implemented, the Preferred Alternative in combination with other cumulative projects would result in cumulatively significant delays to emergency response times. Therefore, the incremental effect of the Preferred Alternative would be cumulatively considerable for emergency response times, and remain significant and unavoidable.

The Authority finds that there are no other feasible mitigation measures that will reduce this impact to emergency response times to a less-than-cumulatively-considerable level. To the extent that this cumulatively considerable adverse impact remains significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations (Chapter 8) support certification of the Final EIR/EIS and approval of the project.

5.7 Aesthetics and Visual Quality

The construction of new permanent project infrastructure, combined with other planned development in the cumulative RSA, would result in permanent significant cumulative aesthetic impacts under CEQA where the visual quality and setting would be degraded by construction that contrasts in scale with existing development and where highly sensitive residential viewers are present. While aesthetic guidelines (AVQ-IAMF#1) and an aesthetic review process to integrate the HSR infrastructure in the surrounding landscape and local context (AVQ-IAMF#2) will be incorporated into the project, the project would still change the existing visual character. However, while project construction activities would be limited to areas on or adjacent to the existing rail line, planned developments would be built in scattered locations, with greater exposure to highly sensitive residential viewers than project construction activities. Construction of the Preferred Alternative would not contribute considerably to these permanent cumulative impacts on aesthetics and visual quality. Therefore, under CEQA, no mitigation is required.

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6 FEASIBILITY OF POTENTIAL ALTERNATIVES

CEQA requires the lead agency—the Authority—to consider a reasonable range of potentially feasible alternatives to the proposed project (Cal. Public Res. Code §§ 21002 and 21081; see also CEQA Guidelines § 15126.6). *Feasible* means capable of being accomplished in a successful manner within a reasonable time, taking into account economic, environmental, legal, social, and technological factors (CEQA Guidelines § 15364). The range of alternatives to be considered is governed by a “rule of reason” that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives must be limited to ones that would feasibly attain most or all of the basic objectives of the project (CEQA Guidelines § 15126.6(f)) while avoiding or substantially lessening any of the significant effects of the project. An EIR need not study in detail an alternative that a lead agency “has reasonably determined cannot achieve the project’s underlying fundamental purpose” (*In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings* (2008) 43 Cal.4th 1143, 1165).

Prior to moving forward with a project for which significant impacts on the environment are identified, CEQA requires that the lead agency find that “specific economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the project alternatives identified in the environmental impact report” (Cal. Public Res. Code § 21081). The determination of infeasibility “involves a balancing of various ‘economic, environmental, social, and technological factors’” (*City of Del Mar v. City of San Diego* [1982] 133 Cal.App.3d 401, 417). Where there are competing and conflicting interests to be resolved, the determination of infeasibility “is not a case of straightforward questions of legal or economic feasibility,” but rather, based on policy considerations (*California Native Plant Society v. City of Santa Cruz* [2009] 177 Cal.App.4th 957, 1001-02). “[A]n alternative that is ‘impractical or undesirable from a policy standpoint’ may be rejected as infeasible” (*Id.* at p. 1002 citing 2 Kostka & Zischke, Practice under CEQA (Cont.Ed.Bar 2010) Section 17.29, p. 824).

The key policy considerations that must be balanced in determining the feasibility of the project alternatives include the following:

- The Authority’s statutory responsibility, which is to:
 - “[D]irect the development and implementation of intercity high-speed rail service that is fully integrated with the state’s existing intercity rail and bus network, consisting of interlinked conventional and high-speed rail lines and associated feeder buses. The intercity network in turn shall be fully coordinated and connected with commuter rail lines and urban rail transit lines developed by local agencies, as well as other transit services, through the use of common station facilities whenever possible (Public Utilities Code § 185030).”
- The purpose of the statewide HSR system, which is to provide reliable high-speed electrified train system that links the major metropolitan areas of the state, and that delivers predictable and consistent travel times. A further objective is to provide an interface with commercial airports, mass transit and the highway network and relieve capacity constraints of the existing transportation system as increases in intercity travel demand in California occur, in a manner sensitive to and protective of California’s unique natural resources.
- The purpose of the San Francisco to San Jose Project Section, which is to provide the public with electric-powered HSR service that offers predictable and consistent travel times between San Francisco and San Jose, facilitates connectivity to SFO and SJC, mass transit, the Bay Area highway network, and the statewide HSR system to:
 - Achieve HSR service that meets Proposition 1A, The Safe, Reliable, High-Speed Passenger Train Bond Act (Prop 1A) travel time requirements in the Caltrain corridor
 - Provide blended system infrastructure that supports commercially feasible HSR, while also minimizing environmental impacts and maximizing compatibility with communities along the rail corridor

- Establish an HSR connection to the economic center of Northern California
- The Authority’s objectives, which are to:
 - Provide intercity travel capacity to supplement critically overused interstate highways and commercial airports
 - Meet future intercity travel demand that will be unmet by current transportation systems, and increase capacity for intercity mobility
 - Maximize intermodal transportation opportunities by locating stations to connect with local transit, airports, and highways
 - Improve the intercity travel experience for Californians by providing comfortable, safe, frequent, and reliable high-speed travel
 - Provide a sustainable reduction in travel time between major urban centers
 - Increase the efficiency of the intercity transportation system
 - Maximize the use of existing transportation corridors and rights-of-way, to the extent feasible
 - Develop a practical and economically viable transportation system that can be implemented and generate revenues in excess of O&M costs
 - Provide intercity travel in a manner sensitive to and protective of the region’s natural and agricultural resources and reduce emissions and VMT for intercity trips
- The characteristics enumerated in Streets and Highways Code Section 2704.09 for the statewide HSR system as a whole, which include electric trains that can operate at high speeds, specified non-stop service travel times between certain cities, and following existing transportation and utility corridors to the extent feasible, as determined by the Authority, to reduce the potential for environmental impacts
- The ability of an alternative to comply with federal CWA Section 404 by qualifying as the least environmentally damaging practicable alternative (LEDPA) in terms of adverse effects on waters of the U.S. and jurisdictional wetlands (CWA § 404(b)(1)). Alternatives other than the LEDPA would not receive the federal Section 404 permit that is necessary for construction. In June 2020, the U.S. Army Corps of Engineers and USEPA provided letters concurring that the Authority’s Preferred Alternative is the preliminary LEDPA for purposes of Section 404 compliance.

6.1 Alternatives Studied in the Final EIR/EIS and Not Selected for Approval

The Draft EIR/EIS and Revised/Supplemental Draft EIR/EIS evaluated the No Project Alternative and Alternatives A and B, and two design variants—the Millbrae Station Reduced Site Plan Design Variant (RSP Design Variant) and the Diridon Design Variant. The Diridon Design Variant was approved by the Authority Board of Directors as part of the San Jose to Merced Project Section in April 2022. Alternative B and the RSP Design Variant were not selected for inclusion in the Authority’s Preferred Alternative and are discussed below. The alternatives and design variants are described in detail in Chapter 2 of the Final EIR/EIS.

Figure 2-1 in the Final EIR/EIS shows the two alternatives carried forward for analysis in the Draft EIR/EIS and Final EIR/EIS.

6.1.1 No Project Alternative—Planned Improvements

The No Project Alternative would result in no construction or operation of the HSR system between San Francisco and San Jose; rather, it considers current plans for land use and transportation in the vicinity of the Project Section, including planned improvements to the highway, aviation, conventional passenger rail, freight rail, and port systems through the 2040 planning horizon. Under the No Project Alternative, the Caltrain PCEP would be built, and the DTX project would extend existing Caltrain commuter service to the STC.

The No Project Alternative is contrary to the Authority’s 2005 programmatic decision to choose the HSR system to meet the state’s transportation demands instead of expanding airports or freeways or doing nothing. The No Project Alternative would not meet any of the project objectives, would not meet the project’s underlying fundamental purpose, and would not allow the Authority to comply with its statutory mandate to “prepare a plan for the construction and operation of a high-speed train network for the state” (Public Utilities Code § 185032) and of Prop 1A (Streets and Highways Code § 2704 et seq.) to develop an HSR project. The Authority therefore finds the No Project Alternative is infeasible and rejects it on that basis.

6.1.2 Selection of the Preferred Alternative over Other Final EIR/EIS Alternatives

The Authority identified the Preferred Alternative by considering environmental, economic, technical, and other factors, and balancing the adverse and beneficial impacts of the project on the human and natural environment. Taking this approach means that no single issue was a decisive factor in identifying the Preferred Alternative in any given geographic area.

The Authority identified Alternative A as the Preferred Alternative for the following reasons:

- Alternative A would have fewer impacts on communities because it would result in fewer displacements and visual quality impacts, would have less impact on planned mixed-use development (where residential is permitted) in Brisbane, and would have fewer temporary road closures that could result in emergency vehicle delays during construction. This conclusion is supported by stakeholder outreach, which has identified a preference for Alternative A because it minimizes impacts on communities.
- Alternative A would have fewer permanent impacts on jurisdictional aquatic resources and would avoid impacts on Icehouse Hill, an area identified for protection by the City of Brisbane because of its biological resource habitat. Alternative A would have fewer impacts on habitat for special-status species.
- Alternative A is also the lower cost alternative and is in better alignment with the Caltrain Business Plan (Caltrain 2040 Service Vision).

Table 8-1 and Section 8.4, Preferred Alternative, in the Final EIR/EIS provide a detailed comparison of the various criteria evaluated for the project alternatives.

6.1.2.1 Alternative B

Although Alternative B would have some operational benefits (e.g., shorter HSR average operational service times, faster recovery from perturbations) and fewer operation noise impacts, Alternative B was rejected as the Preferred Alternative because:

- Alternative B would result in a substantially greater number of residential and business displacements.
- Construction of Alternative B would build the West Brisbane LMF in an area designated for both planned development (residential permitted)—where up to 2,200 residential units are permitted—and planned development (residential prohibited).
- Construction of Alternative B would require the grading of Icehouse Hill, which is a prominent area for biological resource habitat and which the City of Brisbane’s General Plan Amendment identifies to be preserved (City of Brisbane 2018). This would eliminate potentially suitable breeding and rearing habitat for three federally listed butterfly species— Bay checkerspot butterfly, callippe silverspot butterfly, and Mission blue butterfly.
- Alternative B would have greater impacts on jurisdictional aquatic resources.
- Construction of the passing track would require more road closures and generate more construction-related vehicle traffic, resulting in greater temporary congestion/delay on roadways affecting vehicles, emergency response times, and bus transit.

- Construction of the passing track would result in greater disruption to passenger rail and freight rail operations.

6.1.2.2 Millbrae Station Reduced Site Plan Design Variant

The Authority developed the RSP Design Variant as a potentially feasible alternative design for the Millbrae Station to address stakeholder concerns by analyzing a smaller, potentially feasible footprint for the Millbrae Station. The RSP Design Variant preserves HSR track and platform right-of-way needs but reconfigures station facilities, parking, and station access to reduce impacts on existing and planned development. The RSP Design Variant differs from the design of the Millbrae Station evaluated in the Draft EIR/EIS (Millbrae Station Design) and selected by the Authority as the Preferred Alternative by:

- Eliminating surface parking lots on the west side of the alignment that would have served as replacement parking for displaced Caltrain and BART parking spaces
- Relocating the new HSR station entrance hall
- Eliminating lane modifications to El Camino Real
- Eliminating the California Drive extension north of Linden Avenue to El Camino Real from the project

The RSP Design Variant was evaluated in a Revised/Supplemental Draft EIR/EIS, released for public review in July 2021. Subsequently, the analysis of the RSP Design Variant was incorporated into Section 3.20, Millbrae Station Reduced Site Plan Design Variant, of the Final EIR/EIS.

The RSP Design Variant is not included as the preferred design for the Millbrae Station (as part of the Preferred Alternative) because it does not avoid adverse impacts on planned development at the Millbrae Station, the City of Millbrae did not support either the RSP Design Variant or the Millbrae Station Design, and the Millbrae Station Design has substantial operational benefits over the RSP Design Variant in that multimodal and pedestrian access to and within the station are more efficient and effective:

- The Millbrae Station Design would have shorter walking distances from the station hall to the main station concourse and platforms than the RSP Design Variant.
- The Millbrae Station Design would separate pedestrian and vehicular access routes, whereas the RSP Design Variant would not fully separate them.
- The Millbrae Station Design assures effective emergency egress whereas emergency egress with the RSP Design Variant will depend on the future design of California Drive by others.
- The Millbrae Station Design includes configuration of California Drive consistent with Authority station design criteria for station access whereas the effectiveness of HSR station access relative to California Drive with the RSP Design Variant will depend on future design and construction by others.
- The Millbrae Station Design provides direct vehicular access to the station for southbound vehicles on El Camino Real whereas access for this vehicular movement with the RSP Design Variant will depend on the future design of California Avenue by others.
- The Millbrae Station Design includes transit bus bulbouts along El Camino Real supporting efficiency for El Camino Real running transit buses whereas the RSP Design Variant would not and would result in transit drop-off further from the station.

In addition, the RSP Design Variant does not offer substantial environmental benefits compared to the Millbrae Station Design evaluated as part of the Preferred Alternative in the Draft EIR/EIS. While the RSP Design Variant would lessen impacts on bus transit during construction and impacts on existing and planned land uses, the RSP Design Variant would result in a somewhat greater degree of impact on construction-related air quality, construction- and operational-period

noise and vibration, and construction-related visual quality. Section 3.20 of the Final EIR/EIS includes a comparison of impacts for the Millbrae Station Design and RSP Design Variant.

As the City of Millbrae objected to both station designs, the Authority chose the design that was operationally superior.

6.1.2.3 Findings on Final EIR/EIS Alternatives Not Adopted

The selection of the Preferred Alternative reflects a careful balance by the Authority among the factors summarized above as discussed in Chapter 8 of the Final EIR/EIS. The Authority finds Alternative B does not offer a substantial environmental advantage or operational benefits over the Preferred Alternative. The Authority further finds that the specific economic, social, technological and other considerations discussed in Chapter 8 of the Final EIR/EIS and summarized above make Alternative B infeasible. The Authority further finds that the RSP Design Variant is infeasible because it has operational disadvantages compared to the Millbrae Station Design in terms of multimodal and pedestrian access to and within the station, does not avoid conflicts with planned development at the Millbrae Station, and does not offer substantial environmental benefits compared to the Millbrae Station Design.

6.2 Alternatives Suggested in Comments

Comments on the Draft EIR/EIS suggested additional alternatives that commenters believed merited consideration and analysis in the EIR/EIS. These include the following proposals:

- **Millbrae Station**—Commenters suggested alternatives to the proposed Millbrae Station, such as:
 - **Undergrounding some or all of the HSR station and tracks**—The Authority does not consider an underground station option through Millbrae to be a potentially feasible alternative because construction of below-grade station improvements would severely interrupt Caltrain service through the station area, would result in greater disruption of utilities, would have substantially greater capital costs, and would not avoid effects on planned development west of the Millbrae Station.
 - **Removing BART’s third track and realigning other tracks at the Millbrae Station to reduce the project footprint**—The Authority does not consider removal of BART’s third track and realignment of other tracks a potentially feasible alternative because BART has confirmed that all three BART tracks are integral to the safe and efficient operations of the entire BART system.
 - **Refinement of the project design to avoid conflicts with the Millbrae Station Area Specific Plan (MSASP) development**—In response to comments received on the Draft EIR/EIS, the Authority introduced and evaluated impacts of the RSP Design Variant in a Revised/Supplemental Draft EIR/EIS. The RSP Design Variant reflects the smallest possible footprint for the Millbrae Station given engineering and operational requirements and would reduce but not avoid conflicts with the MSASP. No HSR station configuration through Millbrae, even one operating underground, would fully avoid conflict with the MSASP and the Millbrae Serra Station Development. Vertical circulation elements (elevators, escalators/stairs) of an underground station would still require an aboveground footprint that would project into the area designated for the Millbrae Serra Station Development.
 - **Omitting replacement parking or eliminating surface parking at the station**—The Authority determined the use of underground or multilevel parking garages not to be a potentially feasible alternative given their greater cost and construction impacts. The Authority analyzed a variant (the RSP Design Variant) that did eliminate replacement parking and the Authority determined that it was not feasible for the reasons identified in other sections of this document and the Final EIR/EIS.
 - **Eliminating or moving the additional HSR tracks through the Millbrae Station**—Eliminating the additional HSR tracks through the Millbrae Station by sharing tracks with Caltrain is not consistent with the Prop 1A requirement for HSR trains to have the capability to transition through or bypass the station at mainline speeds, which could

affect the reliability of train operations. Sharing tracks with Caltrain would also reduce the resiliency of the system, as dedicated infrastructure provides additional contingencies for both operators in case of emergencies. Moving the HSR bypass track and platform to a location south of the Millbrae Avenue overpass was not found to be feasible due to existing curve constraints south of the station and HSR platform design criteria. Additionally, a track configuration with split platforms would be detrimental to the functionality of the Millbrae Station as an intermodal station. Locating the HSR platform at a substantial distance from BART/Caltrain platforms would also discourage transfers between modes. Based in part on the above reasons, these alternatives were determined to not be feasible.

- **Undergrounding BART tracks and co-locating HSR tracks above the BART track—**
The Authority does not find undergrounding the existing BART tracks and station a potentially feasible alternative based in part on conflicts with BART operations during construction, conflicts with existing underground utilities, the substantial increased costs of constructing a trench/tunnel structure, and the reduced functionality of the Millbrae Station as an intermodal station.
- **LMF—**Commenters suggested alternatives to the Brisbane LMF options, including some sites previously evaluated by the Authority and several sites that were not previously considered by the Authority. These sites were determined to be infeasible, as detailed in Section 17.3.3.4, Light Maintenance Facility Alternatives Suggested by Commenters, of the Final EIR/EIS. Some of those detailed reasons are summarized below:
 - **Bayview Industrial District—**Commenters suggested that the Authority consider a potential LMF site in the Bayview Industrial District in San Francisco. An LMF at the Bayview Industrial District would result in major impacts on aquatic resources (approximately 5 acres) and street circulation elements (Cesar Chavez Street and I-280) in San Francisco. Impacts on the I-280 freeway and associated ramps would likely be unacceptable to Caltrans. For these reasons, the Authority does not consider the Bayview Industrial District a potentially feasible site for the LMF.
 - **Coyote Valley—**Commenters suggested that the Authority evaluate LMF sites south of San Jose, including at a location in the Coyote Valley. A Coyote Valley LMF would be approximately 65 miles from the San Francisco terminal station, which would increase costs and reduce operational reliability associated with increasing the number of miles a non-revenue-generating train would travel. In addition, a Coyote Valley LMF alternative would have greater environmental impacts on habitat for common, threatened, and endangered species than the Brisbane LMF. Therefore, a Coyote Valley LMF is not considered a potentially feasible alternative.
 - **Gilroy—**Commenters suggested that the Authority evaluate LMF sites south of San Jose, including at a location near Gilroy. A Gilroy LMF would be approximately 80 miles from the San Francisco termination station, which would increase costs and reduce operational reliability associated with increasing the number of miles a non-revenue-generating train would travel. The operation costs and inefficiencies would be worse than the Coyote Valley LMF alternative. Furthermore, a Gilroy LMF alternative would have greater environmental impacts, including impacts to habitat for common, threatened, and endangered species, greater hydrology and water quality impacts, and greater impacts related to operational noise than a Brisbane LMF alternative. Therefore, a Gilroy LMF is not considered a potentially feasible alternative.
 - **Two Northern California LMFs—**Comments asserted that the maximum maintenance level at the Brisbane LMF could be lowered to Level I if a Level III LMF were constructed between San Jose and Gilroy. The concept of two separate LMFs, one in Brisbane and one in Gilroy was not considered a potentially feasible alternative because it would require a much larger total footprint than a single LMF providing Level I, II, and III maintenance, resulting in additional construction environmental effects, additional operational costs and staffing, and additional permanent environmental effects.

- **Caltrain 2040 Service Vision**—Commenters suggested that the Authority should include infrastructure to accommodate the Caltrain 2040 Service Vision Plan which includes substantial increases in Caltrain service above the 6 Caltrain trains per peak hour per direction included in blended service planning between the Authority, Caltrain and other transportation planning agencies. The Caltrain Service Vision is beyond the purpose and need of the San Francisco to San Jose Project Section. The Preferred Alternative would not preclude the future corridor improvements envisioned by Caltrain. Thus, the additional infrastructure to support the Caltrain 2040 Service Vision is not part of the HSR project. The Authority has collaborated with Caltrain during development of the vision and will continue to collaborate in rail planning going forward.

If an EIR contains a reasonable range of alternatives, it is not deficient for excluding analysis of other potential alternatives suggested in comments by members of the public or agencies. The Authority finds that the Final EIR/EIS included a reasonable range of alternatives and that the range of alternatives was sufficient to permit a reasoned choice. The Authority therefore finds that no further alternatives were required to be evaluated in the Final EIR/EIS beyond those presented in the Draft EIR/EIS and the Final EIR/EIS.

As summarized above, the Authority further finds that the alternatives suggested in comments are not environmentally superior, do not adequately meet the project purpose/objectives, and/or are infeasible. Detailed information supporting these findings is provided in Standard Response FJ-Response-ALT-2: Millbrae Station Alternatives Considerations and Standard Response FJ-Response-ALT-3: Light Maintenance Facility Alternatives in Final EIR/EIS Volume 4, Responses to Comments on the Draft EIR/EIS and Revised/Supplemental Draft EIR/EIS, Chapter 17, Standard Responses.

6.3 Alternatives Previously Considered and Not Carried Forward for Study in the Draft EIR/EIS

The Authority undertook an extensive screening process for alternatives to study in the Draft EIR/EIS. The many potential alternatives considered but eliminated from detailed study are discussed in Section 2.5, Alternatives Considered during Alternatives Screening Process, of the Final EIR/EIS, Volume 2, Appendix 2-K, Light Maintenance Facility Site Selection Evaluation, and summarized in Standard Response FJ-Response-ALT-1: Alternatives Selection and Evaluation Process and Standard Response FJ-Response-ALT-3: Light Maintenance Facility Alternatives, in Final EIR/EIS Volume 4, Chapter 17. The Authority recently updated and refined the data comparing the costs of the Brisbane LMF sites to other locations considered for evaluation and described in the LMF Site Section Memorandum, dated May 2020, included in Appendix 2-K. While the updated costs show higher costs for the Brisbane LMF sites, the East Brisbane LMF included in the Preferred Alternative remains less expensive than the other sites outside of Brisbane considered. As a part of this recent review, the Authority also evaluated the environmental factors discussed in Appendix 2-K and confirmed the conclusions remain valid.

The Authority finds that each potential alternative discussed in Chapter 2, Appendix 2-K, and the Standard Responses and not carried forward into the Final EIR/EIS for detailed study was appropriately eliminated. Such potential alternatives either failed to adequately meet the project purpose and need/project objectives, failed to offer a substantial environmental advantage to the alternatives studied in the Draft EIR/EIS, or were deemed to not be potentially feasible from a cost, technical or engineering perspective. The Authority therefore finds all such alternatives to be infeasible.

6.4 Preferred Alternative

Alternative A is comprised of a blended system¹⁴ that minimizes community and environmental impacts, while still meeting the overall project objectives consistent with voter-approved Prop 1A. The Authority identified Alternative A as the Preferred Alternative.

As explained in Chapter 8 of the Final EIR/EIS, the Preferred Alternative is an appropriate approval choice among other alternatives considered in the Final EIR/EIS because it represents the best balance of adverse and beneficial impacts on the natural environment and community resources, and it maximizes the transportation and safety benefits of the HSR system at the lowest cost. The Preferred Alternative would result in fewer displacements and visual quality impacts, would have less impact on planned mixed-use development (where residential is permitted) in Brisbane, and would have fewer temporary road closures that could result in emergency vehicle delays during construction. The Preferred Alternative would also have fewer permanent impacts on jurisdictional aquatic resources and would avoid impacts on Icehouse Hill, an area identified for protection by the City of Brisbane because of its biological resource habitat. The Preferred Alternative is also the lower-cost alternative.

Of the 148 Section 4(f) properties evaluated within the RSA for recreational and cultural resources, two historic resources (SPRR Depot/Millbrae Station and SPRR/Menlo Park Railroad Station) were determined to have *de minimis* impacts. The Final EIR/EIS concluded no constructive use of Section 4(f) resources by the Preferred Alternative. The Final EIR/EIS concluded the Preferred Alternative would not affect any Section 6(f) resources.

CEQA Guidelines Section 15126.6(e)(2) states that if the environmentally superior alternative is the No Project Alternative, then the EIR must also identify an environmentally superior alternative among the other alternatives. For the reasons described in the Final EIR/EIS, the environmentally superior alternative is not the No Project Alternative. The HSR alternatives would provide benefits, such as reducing vehicle trips on freeways and reducing regional air pollutants that would not be realized under the No Project Alternative. CEQA does not require a lead agency to select the environmentally superior alternative as its preferred alternative. Nevertheless, the Preferred Alternative is the environmentally superior alternative. The HSR system would have adverse environmental impacts regardless of which alternative is selected, but overall, the Preferred Alternative is identified as the environmentally superior alternative.

The Authority finds that the Preferred Alternative is the environmentally superior alternative overall that best meets the project purpose and need and project objectives.

6.5 Conclusion on Alternatives

In summary, the Authority finds that there are no feasible alternatives that would avoid or substantially lessen the significant adverse impacts of the Preferred Alternative that would remain after application of feasible mitigation measures, while still meeting the project's underlying purpose and project objectives. Because adverse environmental impacts remain, the Authority adopts a Statement of Overriding Considerations, as discussed in the Chapter 8.

¹⁴ The blended system framework defines the system as a predominately two-track blended system that would remain substantially within the existing Caltrain right-of-way.

7 MITIGATION MEASURES SUGGESTED BY COMMENTERS

Some of the comments on the San Francisco to San Jose Project Section Draft EIR/EIS and Revised/Supplemental Draft EIR/EIS suggested additional mitigation measures or modifications to the measures recommended in these documents. Some comments also suggested additions to the project that are not necessarily connected to an adverse environmental impact. The mitigation measures recommended in the San Francisco to San Jose Project Section Draft EIR/EIS represent the professional judgment of subject matter experts on reasonable and feasible approaches to reduce significant adverse environmental impacts. Nevertheless, in some instances, the Authority has incorporated suggestions from comments to refine or improve mitigation in the Final EIR/EIS. This discussion explains the reasons for not incorporating certain of the mitigation measures suggested in comments. The Authority considered the following points in determining whether to include a mitigation measure suggested in comments:

- Whether the suggestion relates to a significant and unavoidable impact of the project, or instead relates to an impact that is already less than significant or can be mitigated to less-than-significant levels by proposed mitigation measures in the Draft EIR/EIS
- Whether the proposed language represents clear improvement, from an environmental standpoint, over the draft language that a commenter seeks to replace
- Whether the proposed language is sufficiently clear to be easily understood by those who will implement the mitigation as finally adopted
- Whether the language might be too inflexible to allow pragmatic implementation
- Whether the suggestions are feasible from an economic, technical, legal, policy, or other standpoint
- Whether the measure addresses an impact not caused by the HSR project
- Whether the measure addresses a social or economic impact, as opposed to an impact on the physical environment

Authority staff, with assistance from subject matter experts, have carefully considered mitigation measures proposed in comments. The following identifies suggestions for mitigation measures that the Authority has not incorporated and the rationale for not including those measures. The list below is not intended to be exhaustive. To the extent that suggestions on mitigation measures that were rejected are not identified below, the Authority finds, based on the analysis contained in the Final EIR/EIS and the record as a whole, that such suggestions are appropriately rejected for one or more of the reasons identified above.

7.1 Section 3.2, Transportation

7.1.1 Measure Addresses an Impact That Is Less Than Significant

The following mitigation measure was not adopted because the impact was identified as less than significant:

- Dedicated bicycle and pedestrian overcrossing in the North Fair Oaks area in unincorporated San Mateo County

San Mateo County suggested the Authority should install a dedicated bicycle and pedestrian overcrossing to link two parts of the North Fair Oaks community that are separated by the existing Caltrain right-of-way, as the County asserts the project would further divide the community. As described in responses to comments in Final EIR/EIS Volume 4, the project would not separate the North Fair Oaks community because it would not create a new community division or further exacerbate the existing community division. There are no at-grade crossings in the North Fair Oaks area, so the project would not affect traffic or emergency vehicle response delay in the area. As described in Final EIR/EIS Section 3.2, the project would not have significant impacts on pedestrian or bicycle access except near the 4th and King Street Station in San Francisco (for which mitigation is identified to reduce the impact to a less-than-significant level). As described in

Section 3.12, Socioeconomics and Communities, the project would have less-than-significant impacts related to disruption or division of an establish community. Consequently, this mitigation is not related to a significant impact.

The following mitigation measure was not adopted because the impact was identified as less than significant after changes in the construction sequence were included in the Final EIR/EIS:

- Temporary Road Access during Brisbane LMF Construction: The Tunnel Avenue bridge relocation (East and West Brisbane LMF) and Tunnel Avenue realignment (East Brisbane LMF only) shall be designed and constructed so as to maintain access along Tunnel Avenue from Beatty Avenue to Bayshore Boulevard as well as access along Lagoon Road between Tunnel Avenue and Sierra Point Parkway open at all times throughout construction of the Brisbane LMF.

The Final EIR/EIS reflects revisions to project plans that will eliminate the need for a temporary roadway closure. As detailed in the conceptual staging plans in the Final EIR/EIS, Tunnel Avenue will remain open in its current configuration and thus continue to provide access until the new overpass is completed. This additional mitigation is not required to address a significant impact.

7.1.2 Measures That Are Considered Infeasible from an Economic, Technical, Legal, Policy, or Other Standpoint

Grade Separations

The following mitigation measures were not adopted because they are considered infeasible due to high capital costs, road closures and traffic disruptions during construction, extensive right-of-way acquisitions, life-cycle maintenance costs, aesthetic concerns due to height of elevated structures, and space-intensive designs:

- Install grade separations at one, multiple, or all at-grade crossings between San Francisco and San Jose to address traffic or transit delays

The Authority initially considered grade-separated alternatives between San Francisco and San Jose in the 2010 Alternatives Analysis and Supplemental Alternatives Analysis for the San Francisco to San Jose Project Section. Such alternatives would require substantial areas of right-of-way acquisition outside the Caltrain right-of-way and displacement of adjacent land uses. With the passage of Senate Bill 1029, the Authority focused on blended service alternatives that are mostly within the Caltrain right-of-way and at grade.

The Final EIR/EIS analyzes the effect of increased gate-down time at the at-grade crossings with the Preferred Alternative on traffic delays at adjacent/nearby intersections under Impact TR#5 in Section 3.2. Because automobile delay is not a significant impact under CEQA, no significant impact is identified under Impact TR#5. TR-MM#1 (as revised for the Final EIR/EIS to include site-specific traffic mitigation measures) provides various standard vehicle capacity enhancements, such as signal retiming or additions, lane restriping, road/intersection widening, and turn pocket additions/increases (including right-of-way acquisitions as needed) to address NEPA effects of traffic delay. TR-MM#1 does not include grade separations as a potential mitigation option for traffic delay.

Constructing grade separations to separate a rail alignment from roads would considerably widen the project footprint and increase environmental impacts including road closures and traffic disruptions during construction, extensive right-of-way acquisitions, aesthetic concerns due to height of elevated structures, and space-intensive designs. In addition, when grade separating alignments, the infrastructure typically extends far beyond an individual roadway crossing because rail operations require that railway slope changes must be gradual. Thus, where there are at-grade roads crossing a rail alignment in close proximity to each other, any grade separation that uses a change in the railway elevation would likely require the changed elevation (whether above or below roadways) to be maintained across all the nearby at-grade crossings. In other words, it would likely not be possible to construct only one grade separation in some areas, where close proximity of at-grade crossings means that constructing one grade separation would

then require constructing multiple other grade separations. This would increase environmental impacts including displacements, construction disruption, and aesthetic effects as well as cost.

While grade separation in the form of putting the rail alignment underground via tunnel can avoid or minimize some of the effects of surficial grade separations, tunnelling approaches still require substantial disturbance areas at the entry and exit points of the tunnel and tunnelling is the most expensive form of grade separation (see discussion below of a tunnel approach in San Francisco).

Overall, grade separations are a highly expensive mitigation strategy. Using an average assumed cost of \$75 million to \$150 million per crossing,¹⁵ grade separating the 39 at-grade crossings between 4th and King Street Station in San Francisco and Scott Boulevard in Santa Clara under the Preferred Alternative would cost an additional \$2.925 billion to \$5.850 billion. Grade separations can cost more than \$150 million each depending on site-specific factors, so this could be an underestimate. For example, the City and County of San Francisco is evaluating options to eliminate the at-grade rail crossings at Mission Bay Drive and 16th Street as an extension of the DTX with the estimated cost ranging from \$1.2 billion for trenched streets up to \$2.1 billion for the currently preferred Pennsylvania Avenue Extension tunnel alignment (these costs are in addition to the estimated \$3.9 billion for DTX itself) (San Francisco County Transportation Authority n.d.; San Francisco Planning 2018).

The Authority, as described in its Business Plans, has not secured funding for constructing the entire Phase 1 system, including the San Jose to Merced Project Section and the San Francisco to San Jose Project Section. Cost has been and will continue to be a major concern for the HSR project as a whole. Given the high costs and disruptions associated with grade separations, committing to grade separations as part of mitigation for Preferred Alternative for the San Francisco to San Jose Project Section is not feasible, as further described in the Final EIR/EIS and its Standard Responses.

However, the Authority, in cooperation with local jurisdictions, transportation funding agencies, and state and federal agencies, supports community-led grade separation efforts. The Authority will work with local jurisdictions that are pursuing grade separation projects on their own so the HSR project, to the extent possible, does not create conflicts with future grade separation efforts.

Traffic Intersection Mitigation

The following mitigation measures were not adopted because they are considered infeasible because they would be inconsistent with the Authority's policy on traffic mitigation:

- There were numerous suggestions from commenters that the Authority should include intersection mitigations at locations other than those proposed in Section 3.2 in the Final EIR/EIS.

As explained in Final EIR/EIS Section 3.2, and Appendix 3.2-C, Traffic Mitigation Measure Screening, the Authority reviewed all intersections identified with NEPA adverse effects on traffic delay. Based on that review, a series of site-specific traffic mitigation measures were identified and screened against the Authority's policy on traffic mitigation, which includes criteria concerning avoiding increases in VMT, consistency with Senate Bill 743, not being more disruptive to the

¹⁵ This is a rough approximation of the average cost of grade separations. Cost varies by existing conditions and design. The City of San Jose, in their comments on the San Jose to Merced Draft EIR/EIS, estimated the cost of grade separating Skyway, Branham, and Chynoweth as ranging from \$400 million to \$1.4 billion (\$133 million to \$467 million per crossing). On the lower end, Caltrain completed the San Bruno Grade Separation Project in 2014, which included three crossings and cost \$147 million, which is approximately \$49 million per crossing (PCJPB 2015). Caltrain and the City of San Mateo completed the San Mateo 25th Avenue Grade Separation Project, which included three crossings and cost \$205 million or about \$68 million per crossing (Caltrain n.d.). Grade separations along busy streets in cities will be of the higher end in terms of costs, whereas locations on smaller roads with lower volumes and less intervening development will be on the low end.

community than the traffic effect itself, not resulting in unmitigable secondary environmental effects, and practicability (including technical, logistical and financial feasibility including the views of local jurisdictions). Appendix 3.2-C provides the reasons why mitigation at other intersections with adverse effects were not included.

The following mitigation measure was not adopted because the Authority is not subject to local impact fees and the EIR/EIS has analyzed potential feasible measures in accordance with Authority policy:

- The Authority should address any unmitigated traffic impacts by paying into a local transportation impact fee.

As explained in Final EIR/EIS Section 3.2 and Appendix 3.2-C, the Authority reviewed all intersections identified with NEPA adverse effects on traffic delay and identified feasible mitigation where it met the Authority's policy on traffic mitigation. The Authority as a state agency is not subject to local jurisdiction requirements. Traffic delay is not an environmental impact that requires mitigation under CEQA.

7.2 Section 3.3, Air Quality and Greenhouse Gases

7.2.1 Measure Addresses an Impact That Is Less Than Significant

The following mitigation measure was not adopted because the impact was identified as less than significant:

- The Draft EIR/EIS should be revised to include a construction GHG emissions mitigation measure that achieves the net zero target. The new mitigation measure should incorporate best management practices to reduce construction GHG emissions recommended by BAAQMD: using alternatively fueled (e.g., biodiesel, electric) construction vehicles/equipment in at least 15 percent of the fleet; using local building materials of at least 10 percent; and recycling or reusing at least 50 percent of construction waste or demolition materials.

As discussed under Impact AQ#14 in the Final EIR/EIS, construction of the Preferred Alternative would result in a less-than-significant GHG impact because emission reductions during operations from reduced auto and aircraft trips would more than offset the short-term construction-related contribution to increased GHG emissions. Accordingly, mitigation to reduce construction-generated GHG emissions is not required. The Authority's Sustainability Policy states the goal of reducing GHG emissions. This goal is not a CEQA significance threshold, has not been adopted as such by the Authority or BAAQMD, and the project is not inconsistent with the policy.

As for incorporation of BMPs to minimize GHG emissions, AQ-IAMF#3 requires construction contractors to use renewable diesel fuel in all heavy-duty off-road diesel-fueled construction equipment and on-road diesel trucks, which will minimize associated GHG emissions. Construction of the project is also subject to the Authority's Sustainability Policy, which requires recycling 100 percent of the steel and concrete from construction and demolition and diverting at least 75 percent of all other construction and demolition waste from landfills, unless local regulations specify a higher diversion rate. The Authority is also committed to sustainable and local procurement.

7.2.2 Measure That is Considered Infeasible from an Economic, Technical, Legal, Policy or Other Standpoint

The following mitigation measure was not adopted because it precludes necessary flexibility in the construction equipment that can be used by the contractor given uncertainty about the availability of construction vehicles to make up the fleet to be used for construction, and therefore is infeasible from a technical, economic, and policy standpoint:

- Commit to using only zero-emission on road and offroad trucks and construction equipment or otherwise use equipment with the best available technology offered at the time of construction.

Existing air quality IAMFs (AQ-IAMF#3 through AQ-IAMF#5) address standards for the construction equipment to be used to construct the Project Section, which will minimize exhaust emissions. Further, the Authority has identified feasible mitigation to address temporary construction impacts on localized air quality from criteria pollutants, including AQ-MM#1 and AQ-MM#2. Moreover, AQ-MM#3 and AQ-MM#4 will offset VOC, NO_x, and particulate matter emissions, as required. However, these offsets could occur regionally throughout the SFBAAB. Therefore, the emission reductions achieved by these offsets may not contribute to enough localized reductions to avoid a project-level violation of the CAAQS or exceedance of an SIL.

From a technical and economic perspective, the Authority is not positioned to require its contractor to use ZE vehicles for 100 percent of its on-road and off-road trucks and construction equipment, in constructing the Project Section. Even analyzing projections of the market for construction equipment in the year 2028, based on conservative assumptions (Chapter 2 of the Final EIR/EIS identifies the construction period as 2022–2028), the market for ZE vehicles for heavy construction and off-road equipment will not be sufficiently mature to allow for the Authority's contractor to use entirely ZE construction equipment (Authority 2022b). While there may be certain prototype equipment being developed, such prototypes are not projected to be available at the scale needed to undertake construction of this large infrastructure project.

From a policy perspective, the Authority is committed to small business participation (Authority 2018a). Requiring an inflexible commitment to ZE construction equipment would not serve the Authority's policy goals related to small business participation, as those small businesses have comparatively less capacity to convert their fleets of off-road vehicles and other construction equipment to ZE.

However, the Authority has committed to integrating ZE vehicles into construction of the Project Section through AQ-MM#1. Moreover, the Authority has committed to using renewable diesel fuel (AQ-IAMF#3) and best available technology for diesel equipment (Tier 4) through AQ-IAMF#4 and AQ-IAMF#5; Tier 4 is currently the strictest emissions standard adopted by CARB.

7.3 Section 3.4, Noise and Vibration

7.3.1 Measures That Are Considered Infeasible from an Economic, Technical, Legal, Policy, or Other Standpoint

The following mitigation measure was not adopted because it is incompatible with the requirements for the HSR project in Prop 1A.

- Operating at slower operating speeds (such as 79 mph instead of up to 110 mph) to reduce noise impacts

The purpose of the HSR project is to provide an efficient rail connection between northern and southern California, including the Central Valley. Prop 1A establishes time requirements for travel on the HSR system that the system must be capable of meeting. In addition, to meet travel demands, the HSR system is designed to achieve travel durations that are competitive with air travel and road travel; accordingly, it must be designed consistent with certain speed requirements. Slowing operational speeds down beyond that currently proposed would hinder the ability of the project to meet its purpose. Furthermore, the EIR/EIS identified feasible mitigation measures to address noise impacts, as described in Section 3.4, Noise and Vibration.

The following mitigation measure was not adopted because it would substantially lengthen the construction period, increasing costs and disruption along the corridor:

- Constructing only in daytime if other measures cannot reduce nighttime impacts to a less than significant level

As explained in response to comments (Volume 4 of the Final EIR/EIS), NV-MM#1 in Section 3.4.7, Mitigation Measures, discusses construction noise mitigation measures. NV-MM#1 requires the contractor to establish a construction noise monitoring program and implement measures to comply with FRA construction noise limits (an 8-hour equivalent sound level of 80 dBA during the day and 70 at night for residential land use, 85 for both day and night for commercial land use,

and 90 for both day and night for industrial land use) where a noise-sensitive receptor is present and wherever feasible. Measures for minimizing construction noise would include prohibiting certain noise-generating activities during nighttime hours, but due to the constraints of working within an active rail corridor some track realignments would require nighttime construction work that could exceed FRA construction noise limits at night.

The following mitigation measure was not adopted because it would be inconsistent with the Authority's established noise mitigation guidelines and policy:

- Elimination of cost-effectiveness criteria of \$95,000 for noise mitigation

The Authority's noise mitigation guidelines are summarized in NV-MM#3 in Section 3.4 of the Final EIR/EIS. These guidelines specify that noise barriers must be considered reasonable and feasible, including achieving a minimum of 5 dB noise reduction, benefitting at least 10 receptors per barrier, be at least 800 feet long, and be cost effective, which is defined as not exceeding \$95,000 per benefitted receptor. The cost-effectiveness criterion is consistent with Caltrans' criteria.

The following mitigation measure was not adopted because it is considered infeasible due to high capital costs, road closures and traffic disruptions during construction, extensive right-of-way acquisitions, life-cycle maintenance costs, aesthetic concerns due to height of elevated structures, and space-intensive designs:

- Grade separations of at-grade crossings to address noise due to sounding of horns at at-grade crossings

Overall, grade separations are a highly expensive and environmentally disruptive mitigation strategy. As noted in Section 7.1 of this document, using an average assumed cost of \$75 million to \$150 million per crossing, grade separating the 39 at-grade crossings between 4th and King Street Station in San Francisco and Scott Boulevard in Santa Clara could cost an additional \$2.925 billion to \$5.850 billion. Grade separations can cost more than \$150 million each depending on site-specific factors, so this estimate may be an underestimate.

In addition to costs, constructing with grade separations to separate the rail alignment from roads would considerably widen the project's footprint and result in greater environmental impacts including road closures and traffic disruptions during construction, extensive right-of-way acquisitions, aesthetic concerns due to height of elevated structures, and space-intensive designs. In addition, when grade separating alignments, the infrastructure typically extends far beyond an individual roadway crossing because rail operations require that railway slope changes must be gradual.¹⁶ Thus, where there are at-grade roads crossing a rail alignment in close proximity to each other, any grade separation that uses a change in the railway elevation would likely require the changed elevation (whether above or below roadways) to be maintained across all the nearby at-grade crossings. In other words, it would not be possible to construct only one grade separation in some areas, where close proximity of at-grade crossings means that constructing one grade separation would then require constructing multiple other grade separations. This can increase the construction and operational environmental impacts of a grade-separated rail alignment.

The Authority, as described in its Business Plans, has not secured funding for constructing the entire Phase 1 system, including the San Jose to Merced Project Section and the San Francisco to San Jose Project Section. Cost has been and will continue to be a major concern for the HSR project as a whole. Given the high costs and disruptions associated with grade separations, the Authority cannot commit to grade separations as part of mitigation.

¹⁶ HSR design (Authority 2019a) for vertical curves limit the design to 0.26 percent to 0.4 percent per 100 feet (e.g., a change of 0.26 to 0.4 foot over 100 feet) at speeds of 125 mph. Allowed vertical curves for higher speeds than 125 mph are more gradual and allowed vertical curves for speeds less than 125 mph are less gradual.

However, the Authority, in cooperation with local jurisdictions, transportation funding agencies, and state and federal agencies, supports community-initiated grade separation efforts. The Authority will work with local jurisdictions that are pursuing grade separation projects on their own so the HSR project, to the extent possible, does not create conflicts with future grade separation efforts.

7.4 Section 3.11, Safety and Security

7.4.1 Measure Addresses an Impact That Is Less Than Significant

The following mitigation measure was not adopted because the impact was identified as less than significant:

- Grade separations of at-grade crossings to address at-grade crossing safety
- Automated enforcement technology
- Intrusion detection
- Closure of driveways and frontage roads

Significant safety impacts are not expected related to increased HSR train crossings through at-grade crossings after consideration of project safety improvements for HSR portions of the corridor and Caltrain existing and planned safety improvements for the Caltrain corridor. As such, no mitigation is proposed for at-grade crossing safety in the EIR/EIS.

Since the project includes the installation of four-quadrant gates, it will also include the installation of vehicle presence detection at the at-grade crossings since California Public Utilities Commission (CPUC) regulations require such detection systems whenever exit gates are used. *Intrusion detection* refers to something above and beyond the mandatory vehicle presence detection at the at-grade crossings when exit gates are used.

Regarding intrusion detection and automated enforcement technology, as explained in the Final EIR/EIS Volume 4, the blended system operations between San Francisco and Scott Boulevard in Santa Clara would be within the Caltrain corridor and the Peninsula Corridor Joint Powers Board (PCJPB) is responsible, as the host railroad, to comply with FRA and CPUC safety requirements for the corridor in consideration of the operating speed and track classifications. While the Authority will install four-quadrant gates at the at-grade crossings that comply with CPUC requirements, it would be up to Caltrain, as the host railroad and operator of the signaling system, to determine if intrusion detection would be integrated with the railroad signaling system for blended system track or whether automated enforcement technology is warranted.

Regarding closure of driveways and frontage roads, this has not been identified in the EIR/EIS as necessary to address at-grade crossing safety. This suggestion, which was made by the CPUC, will be considered by the Authority during final design in coordination with the CPUC.

7.4.2 Measures That Are Considered Infeasible from an Economic, Technical, Legal, Policy, or Other Standpoint

The following mitigation measure was not adopted because of the disadvantages of grade separation include high capital costs, road closures and traffic disruptions during construction, extensive right-of-way acquisitions, life-cycle maintenance costs, aesthetic concerns due to height of elevated structures, additional environmental impacts, and space-intensive designs:

- Grade separations of at-grade crossings to address emergency vehicle response delay impacts

The Authority has identified feasible mitigation to address emergency vehicle response delay impacts, but residual impacts may occur if some of the necessary improvements included in SS-MM#4 are not implemented by local jurisdictions. Grade separations are considered financially infeasible and have extensive environmental effects.

Overall, grade separations are a highly expensive mitigation strategy. As noted in Section 7.1, using an average assumed cost of \$75 million to \$150 million per crossing, grade separating the

39 at-grade crossings between 4th and King Street Station in San Francisco and Scott Boulevard in Santa Clara would cost an additional \$2.925 billion to \$5.850 billion. Grade separations can cost more than \$150 million each depending on site-specific factors, so this estimate may be an underestimate.

The Authority, as described in its Business Plans, has not secured funding for constructing the entire Phase 1 system, including the San Jose to Merced Project Section and the San Francisco to San Jose Project Section. Cost has been and will continue to be a major concern for the HSR project as a whole. Given the high costs and disruptions associated with grade separations, the Authority cannot commit to grade separations as part of mitigation.

In addition to costs, constructing with grade separations to separate a rail alignment from roads would considerably widen the project's footprint and increase environmental impacts including road closures and traffic disruptions during construction, extensive right-of-way acquisitions, aesthetic concerns due to height of elevated structures, and space-intensive designs. In addition, when grade separating alignments, the infrastructure can extend far beyond an individual roadway crossing because rail operations require that railway slope changes must be gradual.¹⁷ Thus, where there are at-grade roads crossing a rail alignment in close proximity to each other, any grade separation that uses a change in the railway elevation will likely require the changed elevation (whether above or below roadways) to be maintained across all the nearby at-grade crossings. In other words, it would likely not be possible to construct only one grade separation in some areas, where close proximity of at-grade crossings means that constructing one grade separation would then require constructing multiple other grade separations. This would increase the construction and operational environmental impacts of a grade-separated rail alignment.

However, the Authority, in cooperation with local jurisdictions, transportation funding agencies, and state and federal agencies, supports community-initiated grade separation efforts. The Authority will work with local jurisdictions that are pursuing grade separation projects on their own so the HSR project, to the extent possible, does not create conflicts with future grade separation efforts.

The following mitigation measure was not adopted because it is considered incompatible with the requirements for the HSR project in Prop 1A:

- Operating at slower operating speeds (such as 79 mph instead of up to 110 mph) to reduce safety impacts

The purpose of the HSR project is to provide an efficient rail connection between northern and southern California, including the Central Valley. Prop 1A establishes time requirements for travel on the HSR system that the system must be capable of meeting. In addition, to meet travel demands, the HSR system is designed to achieve travel durations that are competitive with air travel and road travel; accordingly, it must be designed consistent with certain speed requirements. Slowing operational speeds down beyond that currently proposed would hinder the ability of the project to meet its purpose. As described in Section 3.11, Safety and Security, of the Final EIR/EIS, with project designs and features, no significant impact related to safety at the at-grade crossings was identified.

¹⁷ HSR design (Authority 2019a) for vertical curves limit the design to 0.26% to 0.4% per 100 feet (e.g., a change of 0.26 to 0.4 feet over 100 feet) at speeds of 125 mph. Allowed vertical curves for higher speeds than 125 mph are more gradual, and allowed vertical curves for speeds lower than 125 mph are less gradual.

8 STATEMENT OF OVERRIDING CONSIDERATIONS

The San Francisco to San Jose Project Section Final EIR/EIS, and the CEQA Findings of Fact conclude that the Preferred Alternative for the San Francisco to San Jose Project Section of the California HSR System would result in certain significant impacts on the environment that cannot be avoided or substantially lessened with feasible mitigation measures or feasible alternatives. This Statement of Overriding Considerations is therefore necessary to comply with CEQA, Cal. Public Res. Code Section 21081, and CEQA Guidelines Section 15093. The significant and unavoidable impacts and the benefits related to the Preferred Alternative are described below. The Authority Board has carefully weighed these impacts and benefits and finds that each of the benefits of the Preferred Alternative, independent of the other described benefits, outweighs the significant and unavoidable environmental impacts.

8.1 General Findings on Significant and Unavoidable Impacts Associated with the Preferred Alternative

Based upon the Final EIR/EIS and the CEQA Findings of Fact contained herein, as well as the evidentiary materials supporting these documents, the Authority finds that the Preferred Alternative could result in the following list of significant and unavoidable impacts on the environment:

Transportation

- Impact TR#8: Temporary Impacts on Bus Transit
- Impact TR#11: Continuous Permanent Impacts on Bus Services

Air Quality

- Impact AQ#5: Temporary Direct Impacts on Localized Air Quality in the SFAAB—Criteria Pollutants

Noise and Vibration

- Impact NV#1: Temporary Exposure of Sensitive Receptors to Construction Noise
- Impact NV#2: Intermittent Permanent Exposure of Sensitive Receptors to Noise from Operations
- Impact NV#6: Permanent Exposure of Sensitive Receptors to Vehicular Traffic Noise Increases
- Impact NV#9: Intermittent Permanent Exposure of Sensitive Receptors to Vibration from Operations

Safety and Security

- Impact S&S#6: Continuous Permanent Impacts on Emergency Access and Response Times due to Station Traffic and Increased Gate-Down Time

Station Planning, Land Use, and Development

- Impact LU#4: Permanent Alteration of Land Use Patterns from Land Use Conversion and Introduction of Incompatible Uses at Stations
- Impact LU#5: Permanent Alteration of Land Use Patterns from Land Use Conversion at the Brisbane Light Maintenance Facility

Cumulative Impacts

- Operation of the Preferred Alternative would make a cumulatively considerable contribution to cumulatively significant impacts on bus transit service performance at certain locations.

- Construction of the Preferred Alternative would make a cumulatively considerable contribution to cumulatively significant impacts for localized PM_{2.5} and PM₁₀ emissions after all feasible mitigation.
- Construction of the Preferred Alternative would make a cumulatively considerable contribution to cumulatively significant impacts for total cumulative cancer risks and noncancer impacts on sensitive receptors and health risks of PM_{2.5} concentrations. While the Authority will coordinate with BAAQMD to identify if there are feasible additional measures consistent with the HSR project that may lower some of the cumulative health risks, the feasibility and effectiveness of any such measures are unknown at this time and not presumed for the purposes of CEQA determinations.
- Operation of the Preferred Alternative would make a cumulatively considerable contribution to cumulatively significant noise impacts and vibration impacts after all feasible mitigation.
- Operation of the Preferred Alternative would make a cumulatively considerable contribution to cumulatively significant impacts on emergency response times.

With the approval of the Preferred Alternative and the adoption of the CEQA Findings of Fact, the Authority is committing to the mitigation measures identified for the Preferred Alternative to mitigate significant impacts to a less-than-significant level to the extent feasible, and minimize and mitigate the project's contribution to cumulative impacts to the extent feasible. As set forth in detail in Chapter 4, Findings on Specific Impacts and Mitigation Measures, the Authority finds that the mitigation measures adopted with the findings are the appropriate measures to approve at this time because they apply to the Preferred Alternative.

The Authority further finds that while the mitigation measures it adopts as part of the CEQA Findings of Fact will substantially lessen or avoid many of the significant environmental impacts discussed in the Final EIR/EIS, and mitigation adopted to address one area may result in beneficial effects in other subject areas, the impacts listed above would not all be mitigated to a less-than-significant level, and remain significant and unavoidable.

The Authority finds that each of the following specific economic, legal, social, technological, environmental and other considerations and benefits of the Preferred Alternative, separately and independently, outweighs the unavoidable adverse environmental effects of the project. The Authority further finds that each is an overriding consideration independently warranting project approval. The Authority finds that the significant and unavoidable impacts of the project are overridden by each of these individual considerations, standing alone. The significant and unavoidable environmental impacts remaining after mitigation measures are considered acceptable in light of these significant benefits of the Preferred Alternative, as described in this Statement of Overriding Considerations.

8.2 Overriding Considerations for the Preferred Alternative as Part of the Phase 1 High-Speed Rail System between San Francisco and Los Angeles/Anaheim

There are numerous benefits of the Preferred Alternative when considered as an integral part of the Phase 1 HSR system between San Francisco and Los Angeles/Anaheim. These benefits, viewed both individually and collectively, outweigh the significant and unavoidable adverse effects of the Preferred Alternative. These benefits are in the areas of the environment, transportation, economics, and social considerations, and are set forth in the following subsections.

8.2.1 Environmental Benefits

As discussed in the Final EIR/EIS, the benefits of the HSR system include reduced VMT, reduced energy use for transportation, and reduced air pollution from transportation sources, including reduced emissions of GHGs (Section 3.2, Section 3.3, and Section 3.6 of the Final EIR/EIS). These benefits were derived based on the assumption in the Final EIR/EIS that the San Francisco to San Jose Project Section will be operational as part of the Phase 1 HSR system

between San Francisco and Los Angeles/Anaheim. The following summarizes the conclusions of specific benefits that were disclosed in the Final EIR/EIS.

8.2.1.1 Benefits from a Reduction in Vehicle Miles Traveled

The HSR project as a whole would divert automobile trips to HSR trips, thus reducing statewide, regional, and local VMT (Authority and FRA 2012). For 2029 at full Phase I HSR system operations (San Francisco to Anaheim), Silicon Valley to Central Valley HSR ridership is estimated to be 48.9 million annual trips with 41.5 million annual trips diverted from automobiles and 3.8 million annual trips diverted from air travel. For 2040 at full Phase I HSR system operations, Silicon Valley to Central Valley HSR ridership is estimated to be 54.1 million annual trips with 47.3 million annual trips diverted from automobiles and 4.7 million annual trips diverted from air travel (Appendix 3.2-B, Vehicle Miles Traveled Forecasting, of the Final EIR/EIS). Statewide air travel would also be decreased with mode shifting from air to HSR travel assumed by reductions in the number of statewide flights. With the implementation of Silicon Valley to Central Valley HSR service, air flights are anticipated to be reduced by 107,154 flights in 2040 with full Phase 1 HSR system in operation. The reduction in both automobile and air travel VMT would provide benefits in the form of reduced congestion on the state's highway system and at airports.

Section 3.2 of the Final EIR/EIS for the project arrives at similar conclusions regarding VMT reduction at a regional level. By 2029, the project would reduce overall VMT from 2.530 billion miles to 2.512 billion miles in San Francisco County, from 4.735 billion miles to 4.669 billion miles in San Mateo County, and from 12.185 billion miles to 12.026 billion miles in Santa Clara County. By 2040, the project would reduce overall VMT from 2.720 billion miles to 2.697 billion miles in San Francisco County, from 4.963 billion miles to 4.873 billion miles in San Mateo County, and from 13.202 billion miles to 12.972 billion miles in Santa Clara County (Authority 2022a: Impact TR#1).

8.2.1.2 Benefits from a Reduction in Air Pollution and Greenhouse Gas Emissions

The Final EIR/EIS considered the air quality emissions associated with the Preferred Alternative. As shown in Table 3.3-25 through Table 3.3-27 in the Final EIR/EIS, emission results indicate that operation of the Preferred Alternative would result in net decreases in all criteria pollutant emissions (VOC, CO, NO_x, sulfur dioxide, PM₁₀, and PM_{2.5}) when compared to 2015 Existing and 2029 and 2040 No Project conditions. These decreases would be beneficial to the affected air basins and help the basins meet their attainment goals, consistent with the air quality management plan set forth by the BAAQMD. Although project operations would increase criteria pollutants associated with power plants, train movement, stations, and a maintenance facility, it would result in sizeable emissions reductions from on-road vehicles and aircraft relative to the 2015 Existing and 2029 and 2040 No Project conditions. These emissions benefits would be achieved by reductions in single-occupancy vehicle trips and aircraft activity; with more people traveling on the HSR system, fewer vehicle and aircraft trips would occur. Ultimately, the criteria pollutant reductions achieved by changes in on-road vehicles and aircraft activity would more than offset the emissions increase from project operations (electricity, train movement, stations, and a maintenance facility). Long-term operations of the project and the larger HSR system would, therefore, result in a net reduction in operational emissions from the 2015 Existing and 2029 and 2040 No Project conditions (Authority 2022a: Tables 3.3-25 through 3.3-27).

Emission reductions during operations of the project from reduced auto and aircraft trips would offset the short-term construction-related contribution to increased GHG emissions. Preferred Alternative construction would generate GHG emissions. However, these emissions would be almost fully offset after 2 to 6 months of the Preferred Alternative operating as part of Phase 1 (depending on the ridership scenario). Shortly following the first year of operations, the Preferred Alternative operating as part of Phase 1 would result in annual emissions reductions and a GHG benefit as travel modes shift away from on-road vehicles and aircraft trips to HSR.

Additionally, the project is identified in CARB's Assembly Bill (AB) 32 Scoping Plan and 2017 Scoping Plan Update as a component of a sustainable transportation system, and would be consistent with the state's plan to achieve GHG emissions reductions in the long run (CARB 2008, 2018). The GHG reductions from the Preferred Alternative operating as part of the Phase 1 HSR system would be consistent with statewide goals. Long-term operation of the HSR system would reduce GHG emissions, relative to No Project conditions, resulting in a statewide and regional GHG benefit. Annual reductions would range from 1.1 million metric tons carbon dioxide equivalent (CO₂e) to 1.6 million metric tons CO₂e, depending on the ridership scenario (Authority 2022a: Impact AQ#17, Table 3.3-32).

SB 375 is one major tool being used to meet AB 32's goals. SB 375 sets priorities to help California meet GHG-reduction goals and requires that regional transportation plans prepared by metropolitan planning organizations include a sustainable communities strategy that supports the GHG emission reduction targets set by CARB. However, recent CARB (2018, 2021) analysis indicates that California is not on track to meet its climate-based mobility goals, and additional reductions in VMT are needed. That said, because of the potential for transit-oriented development and other land use planning benefits from HSR implementation in San Francisco and Millbrae, the HSR project would contribute to planned VMT and GHG reductions as a key investment strategy in the Metropolitan Transportation Commission's adopted *Plan Bay Area 2050* (Association of Bay Area Governments and Metropolitan Transportation Commission 2021). The HSR project would expand and modernize the regional rail system, with HSR stations as a Plan Bay Area 2050 growth geography, a focal point in the region to locate future jobs and housing, which, combined with other *Plan Bay Area 2050* strategies, would result in a compact, efficient growth pattern that meets CARB's GHG reduction targets and provides adequate housing for the Bay Area's growing population.

8.2.1.3 Benefits from a Reduction in Energy Use

The Final EIR/EIS acknowledges that, although the Phase 1 HSR project would require electricity to operate, it would nevertheless result in permanent net reduction in energy use because it would divert trips from transportation modes with higher energy use (commercial air flights and automobiles) to HSR, which has lower energy use. Section 3.6, Public Utilities and Energy, of the Final EIR/EIS concluded that operation of the HSR would result in a reduction in VMT in San Francisco, San Mateo, and Santa Clara Counties and would also result in a reduction in airplane flights in the Bay Area in which the project is located. The reduction in energy consumption for other modes of transportation that would result from operation of the HSR exceeds the increase in energy consumption for HSR operation of the project, resulting in a net decrease in statewide energy consumption. As a result, operation of the HSR would result in a net benefit to energy resources.

The HSR system would decrease automobile VMT and reduce energy consumption by automobiles, resulting in an overall reduction in energy use for intercity and commuter travel. Table 3.6-19 in the Final EIR/EIS shows the change in estimated daily VMT and associated energy consumption with and without the HSR system for the medium and high ridership scenarios for 2029 and 2040. HSR operation would reduce daily VMT in San Francisco, San Mateo, and Santa Clara Counties by 182 million to 246 million VMT per year in 2029 for the medium and high ridership scenarios, and by 345 million to 462 million VMT per year in 2040 for the medium and high ridership scenarios. These values, together with associated average daily speed estimates, were used to develop predictions of the change in energy use associated with VMT for the three counties. The reduction in energy use from the VMT reduction in San Francisco, San Mateo, and Santa Clara Counties in 2029 ranges from 586,580 million British thermal units (MMBtu) per year to 787,880 MMBtu per year under the medium and high ridership scenarios. The reduction in energy use from the VMT reduction in San Francisco, San Mateo, and Santa Clara Counties in 2040 ranges from 984,740 MMBtu per year to 1,117,360 MMBtu per year under the medium and high ridership scenarios.

The number of airplane flights statewide (intrastate) would decrease with implementation of the HSR system when analyzed against the future No Project and existing conditions because some

travelers would choose to use HSR rather than fly to their destination. Table 3.6-20 of the Final EIR/EIS shows the reduction in the number of airplane flights associated with the Preferred Alternative for the medium and high ridership scenarios. Operation under the medium ridership scenario would reduce energy consumption from airplane flights by 2,478,640 MMBtu per year for the Bay Area and by 6,255,290 MMBtu per year statewide in 2029. Operation under the high ridership scenario would reduce energy consumption from airplane flights by 2,716,740 MMBtu per year for the Bay Area and by 6,915,460 MMBtu per year statewide in 2029. Operation under the medium ridership scenario would reduce energy consumption from airplane flights by 5,279,340 MMBtu per year for the Bay Area and by 13,362,110 MMBtu per year statewide in 2040. Operation under the high ridership scenario would reduce energy consumption from airplane flights by 5,052,810 MMBtu per year for the Bay Area and by 12,855,700 MMBtu per year statewide in 2040.

Final EIR/EIS Table 3.6-21 and Table 3.6-22 summarize energy consumption for project operation and the resulting changes in regional and statewide energy consumption from the reduction in VMT and airplane flights that would occur as a result of operation of the HSR for 2029 and 2040. Operation of the project in 2029 would reduce regional energy consumption by 2,791,310 MMBtu per year under the medium ridership scenario and by 3,203,320 MMBtu per year under the high ridership scenario. Operation of the project in 2029 would reduce statewide energy consumption by 8,365,550 MMBtu per year under the medium ridership scenario and by 5,964,040 MMBtu per year under the high ridership scenario. Operation of the project in 2040 would reduce regional energy consumption by 5,943,280 MMBtu per year under the medium ridership scenario and by 5,817,300 MMBtu per year under the high ridership scenario. Operation of the project in 2040 would reduce statewide energy consumption by 15,427,700 MMBtu per year under the medium ridership scenario and by 23,641,110 MMBtu per year under the high ridership scenario (Authority 2022a: Impact PU&E#13).

8.2.1.4 Other Environmental Benefits

The Authority has planned the Phase 1 HSR system by following existing transportation corridors to the maximum extent feasible as a way to avoid and minimize the potential for environmental impacts while still meeting the project’s fundamental purpose and objectives. The Preferred Alternative has been designed to minimize the potential for adverse environmental impacts and to maximize compatibility with Peninsula communities, to the greatest extent feasible in light of the project’s objectives. In this way, the San Francisco to San Jose Project Section meets the purpose and need and project objectives for improving the state’s transportation options and meeting growing transportation demand, while doing so in an environmentally sensitive way.

The Authority’s studies have shown that the HSR system can be constructed with less land and with fewer natural and community impacts than providing a similar level of mobility through expanded highways and airports (Authority 2012b, 2019b). The 2019 Equivalent Capacity Analysis Report found that it would cost an estimated \$122 billion to \$199 billion to provide the equivalent level of transportation capacity in highway lane-miles (4.196 lane-miles) and airport capacity (91 gates and 2 runways) that the Phase 1 HSR system would provide. Compared to the Phase 1 cost estimates, which range from \$69 billion to \$99 billion, investment in HSR is the more affordable choice (Authority 2019b).

8.2.2 Transportation Benefits

8.2.2.1 Increases Mobility, Reduces Congestion, and Travel Delays by Providing a Safe, Reliable, and New High-Speed Travel Mode

The capacity of California’s intercity transportation system is insufficient to meet existing and future demand, and the current and projected future congestion of the system will continue to result in deteriorating transportation conditions, reduced reliability, and increased travel times. The system has not kept pace with the tremendous increase in population, economic activity, and tourism in California. The interstate highway system, commercial airports, and conventional passenger rail system serving the intercity travel market are operating at or near capacity and will require large public investments for maintenance and expansion to meet existing demand and

future growth over the next 20 years and beyond. Moreover, the ability to expand major highways and key airports is uncertain; some needed expansions may be impractical or may be constrained by physical, political, or other factors, as discussed in the Final EIR/EIS Section 1.2.4, Statewide and Regional Need for the High-Speed Rail System in the San Francisco to San Jose Project Section.

As described in Final EIR/EIS Chapter 1, Project Purpose, Need, and Objectives, the Preferred Alternative as part of the Phase 1 HSR system would meet the need for a safe, reliable mode of travel that would link the major metropolitan areas of the state and deliver predictable, consistent travel times sustainable over time. The HSR system also would provide quick, competitive travel times between California's major intercity markets. For intercity trips such as Merced to San Francisco or Los Angeles, the HSR system would provide considerably quicker travel times than either air or automobile transportation, and would bring frequent HSR service to portions of the state such as the Central Valley that are not well served by air transportation. In addition, due to the HSR pricing model, the passenger cost for travel on HSR would be lower than for travel by air for the same intercity markets (Authority 2020a: Table 5-1).

The result with implementation of the HSR project would be substantial reduction in expected VMT in the counties crossed by the project alignment when compared to the No Project conditions, which would reduce traffic on intercity highways and around airports and reduce the need for their expansion by adding a new mode to the state's transportation infrastructure. As discussed in Section 3.2 of the Final EIR/EIS, the project would reduce overall 2029 VMT by 17.7 million miles in San Francisco County, 66.2 million miles in San Mateo County, and 159 million miles in Santa Clara County. By 2040, the project would reduce overall VMT by 24.4 million miles in San Francisco County, 90.3 million miles in San Mateo County, and 230 million miles in Santa Clara County (Authority 2022a: Impact TR#1). In addition to reducing VMT and traffic on intercity highways, the San Francisco to San Jose Project Section would connect the HSR system and SFO via the Millbrae Station, which would help to alleviate capacity constraints at SFO by providing a new transportation mode between San Francisco and Los Angeles as part of the Phase 1 HSR system.

By providing a new intercity, interregional, and regional passenger mode, the HSR system would improve connectivity and accessibility to other existing transit modes and airports. Travel options available in the Central Valley and other areas of the state with limited bus, rail, and air service for intercity trips would be improved. The HSR system connecting the Bay Area to the Central Valley would provide beneficial transportation impacts beyond additional modal connectivity. The change from vehicles to HSR would reduce daily auto trips and corresponding vehicle delay and congestion. A substantial amount of intercity auto travel (primarily using U.S. Highway [US] 101, State Route [SR] 99, and I-5) would divert to HSR service, relieving projected future congestion on these highways. The reduction in future intercity trips would also improve the ability of US 101, SR 99, and I-5 to accommodate freight traffic and would improve projected travel speeds on the freeway. The HSR system would also provide system redundancy in cases of extreme events such as adverse weather or petroleum shortages (HSR trains are powered by electricity, which can be generated from non-petroleum fueled sources; most automobiles and airplanes currently require petroleum). The HSR system would provide a predominantly separate transportation system that is less susceptible to many factors influencing reliability such as capacity constraints, congestion, and incidents that disrupt service.

The state's growing population and the growing demand on the state's transportation system were the early impetus for HSR in California. There are plans for improving the existing freeway network in San Francisco, San Mateo, and Santa Clara Counties through efficiency enhancements and widening roadways to add capacity; however, these improvements would not be sufficient to ease traffic flow and accommodate expected population and employment growth in the area (Authority and FRA 2005: Chapter 1). The same trends that motivated California to investigate, support, and proceed to plan the HSR system are just as compelling today as in the last two decades. The state's need for an expanded safe, reliable, and fast mode of intercity travel to meet its growing transportation demands continues to be a critical policy basis for moving the Preferred Alternative forward as part of the larger HSR system (Final EIR/EIS Section

1.2, Purpose of and Need for the High-Speed Rail System and the San Francisco to San Jose Project Section).

8.2.2.2 Provides Passenger Rail and Transit Connectivity Between the Central Valley and San Francisco Bay Area

The project, which would provide connectivity between sections of the HSR system in the Central Valley and the Bay Area, would provide a new regional surface transportation system that complements and connects with existing transportation modes. Connecting the Central Valley with the Bay Area would transform the relationship between the two regions by increasing mobility and reducing travel times (Authority 2018b). There is limited passenger rail service between the Bay Area and the Central Valley and car travel between the regions can take multiple hours. The Preferred Alternative operating as part of the Phase 1 HSR system would offer substantially more transportation service than existing rail passenger service at a much more reliable and faster travel time than cars between the regions (Authority 2020a). Additionally, the HSR connection would provide redundancy in the transportation network that maintains a transportation connection between the regions in the case of major disruptions on the roads. Regular, fast, and reliable travel would allow employers to expand their option for office locations and for employees to have a wider range of job opportunities available to them. Agglomeration economies are likely to accrue to the state's economy from this increased and improved connectivity between the two regions (Authority 2018a: pages 6 and 20; 2018b).

8.2.3 Economic and Social Benefits

The Phase 1 HSR system would generate economic benefits related to revenue generated by the system, economic growth and jobs generated by construction and operation of the system, benefits from reduced delays to air and auto travelers, and economic advantages related to proximity to the HSR system's stations.

8.2.3.1 Revenue Benefits

As described in the Final EIR/EIS, during operation, the Preferred Alternative operating as part of the Phase 1 HSR system would generate sales tax in the region from both direct and indirect effects (Authority 2022a: Impact SOCIO#18). The sales tax generation associated with operation of the Preferred Alternative is anticipated to exceed sales tax revenues lost from displacements (Authority 2022a: Impact SOCIO#12). The increased sales tax revenues generated by purchases associated with operation of two passenger rail stations would go to the cities and counties. In addition, HSR employees as well as patrons arriving at and departing from the two stations would make purchases that would contribute to increases in regional sales tax revenues.

8.2.3.2 Economic Growth and Jobs

The Phase 1 HSR system would generate the equivalent of approximately 624,000 job years of employment, \$46 billion in labor income, and nearly \$131 billion in economic output (Authority 2020a). Operation of the Phase 1 HSR system is estimated to create up to 3,800 direct jobs (Authority 2016). In addition, the HSR system would improve the economic productivity of workers engaging in intercity travel by providing an option to avoid the delays and unpredictability associated with air and highway travel. These economic benefits are in marked contrast to the cost of expanding airports and highways, which would be approximately twice the cost of the HSR system to meet the future transportation demand, assuming this type of expansion is even feasible (Authority 2012c; Parsons Brinkerhoff 2011).

8.2.3.3 Economic Advantages Related to Proximity to HSR Stations

Experiences in other countries have shown that an HSR system can provide a location advantage to those areas in proximity to an HSR station because an HSR system would improve accessibility to labor and customer markets, potentially improving the competitiveness of the state's industries and the overall economy. Businesses that locate in proximity to an HSR station could operate more efficiently than businesses elsewhere (Final EIR/EIS Section 3.12). This competitive advantage may be pronounced in high-wage employment sectors that are frequently

in high demand in many communities. The HSR system would provide an opportunity for connectivity for sectors of the population who currently are limited in their travel options. In addition, HSR is a mode of transportation that can strengthen urban centers. In combination with supportive local land use policies, the increased accessibility afforded by the HSR system would encourage more intensive urban development and lead to higher property values around stations.

Economic benefits at state, regional and local levels are anticipated with increased statewide accessibility and reduced travel times of HSR service. Regional employment and income growth that strengthens global competitiveness can arise from agglomeration economies associated with a statewide HSR network that links together California's largest cities and regions with supportive land use policy to enable higher-density urban development in HSR station areas (Mirakami and Cervero 2010).

Increased HSR interregional accessibility can attract knowledge and service-based firms to co-locate at higher density, regional transportation served HSR station areas (Mirakami and Cervero 2010), which can foster the agglomeration benefits of higher labor productivity, creativity, and synergy associated with face-to-face contact to exchange knowledge and access to specialized labor (Cambridge Systematics, Inc. 1998).

Cities can realize agglomeration benefits with proactive public policies to guide public and private investment to enable transit-oriented urban development that leverages the accessibility efficiencies and competitive economic advantages of station areas linked together in a statewide HSR network (Mirakami and Cervero 2010). Attracting transit-oriented employment and population growth in station areas can lead to higher transit ridership, revenues, property values and investment in station areas (Cervero et al. 2002).

8.2.4 Benefits May Be Lower Initially than in 2040, but Will Increase Over Time

The Authority's 2016, 2018, and 2020 Business Plans (Authority 2016, 2018a, 2020a) describe a phased implementation strategy for construction of the Phase 1 HSR system that acknowledge funding constraints. Because the system may be constructed and implemented more slowly over time than assumed in the Final EIR/EIS for purposes of environmental analysis (the Final EIR/EIS assumed 520-mile Phase 1 statewide HSR system with mature operations by 2040), based on funding availability, benefits of the system may also accrue more slowly over time. The Final EIR/EIS assumed a time horizon for analysis of 2040, and prepared analysis of project benefits for that horizon year. An operational HSR system, however, would continue to provide VMT reduction, air pollutant reduction, and GHG reduction benefits long past the 2040 horizon of the Final EIR/EIS, and these benefits would build over time as ridership on the system increases. As discussed in the 2020 Business Plan, over time, the average annual GHG emissions savings of the Phase 1 HSR system, 1.9 million metric tons CO₂e, is projected to be the equivalent of taking 400,000 passenger vehicles off the road every year (Authority 2020a).

In addition, the Authority has previously committed to power HSR with an energy portfolio of 100 percent renewable sources and confirmed the feasibility of this approach with industry (Authority 2008, 2014a). This commitment was reaffirmed in the 2018 and 2020 Business Plans (Authority 2018a, 2020a). The environmental benefit of powering HSR with 100 percent renewable energy is substantial in terms of carbon dioxide reduction benefits. Over time, a 100 percent renewable portfolio has potential to increase the GHG reduction benefits from HSR operations over a non-renewable portfolio.

In summary, although benefits of the HSR system in the areas of VMT reduction, air pollution, GHG reduction, and reduced transportation energy use may be lower initially than described in the Final EIR/EIS because of a phased implementation strategy, the benefits would still be significantly positive, would still continue to accrue and grow over time, and would eventually achieve and exceed the level of benefit the Final EIR/EIS describes. These benefits therefore still outweigh the significant and unavoidable adverse environmental impacts described in the Final EIR/EIS and CEQA Findings of Fact.

8.3 Benefits of the Preferred Alternative in Connection with the Previously Approved San Jose to Merced, Merced to Fresno, Fresno to Bakersfield, and Bakersfield to Palmdale Project Sections

The Preferred Alternative would also have numerous benefits that outweigh the unavoidable adverse impacts in the San Francisco to San Jose Project Section when considered with the previously approved San Jose to Merced, Merced to Fresno, Fresno to Bakersfield, and Bakersfield to Palmdale Project Sections, even without considering other portions of the Phase 1 HSR system that are anticipated to be approved and constructed in the future.

8.3.1 Expands the Initial HSR in the Central Valley to Reach the Bay Area and Provides Opportunity for Expanded Early Interim Service

An important benefit of the Preferred Alternative is that it would create an opportunity for the Authority to expand its initial HSR service in the Central Valley between Merced and Bakersfield to the west, to reach the Bay Area. The Authority has previously approved the Merced to Fresno and Fresno to Bakersfield Project Sections, comprising the roughly 171-mile backbone of the Phase 1 HSR system in the Central Valley, including the Central Valley Wye and HSR alignment to the west (Authority 2012d, 2012e, 2014b, 2018c, 2018d, 2020b, 2020c, 2020d). In 2021, the Authority approved the Bakersfield to Palmdale Project Section Preferred Alternative, adding 79 miles between Bakersfield and Palmdale to create 250 miles of contiguously approved HSR alignment (Authority 2021a, 2021b, 2021c). In April 2022, the Authority approved the San Jose to Merced Project Section, adding 89 miles between the Central Valley Wye and San Jose. The Preferred Alternative would extend the HSR alignment another 43 miles to the west and north, reaching the 4th and King Street Station in San Francisco and creating 382 miles of approved HSR alignment. See Figure 3 for locations and project status of the California HSR project sections.

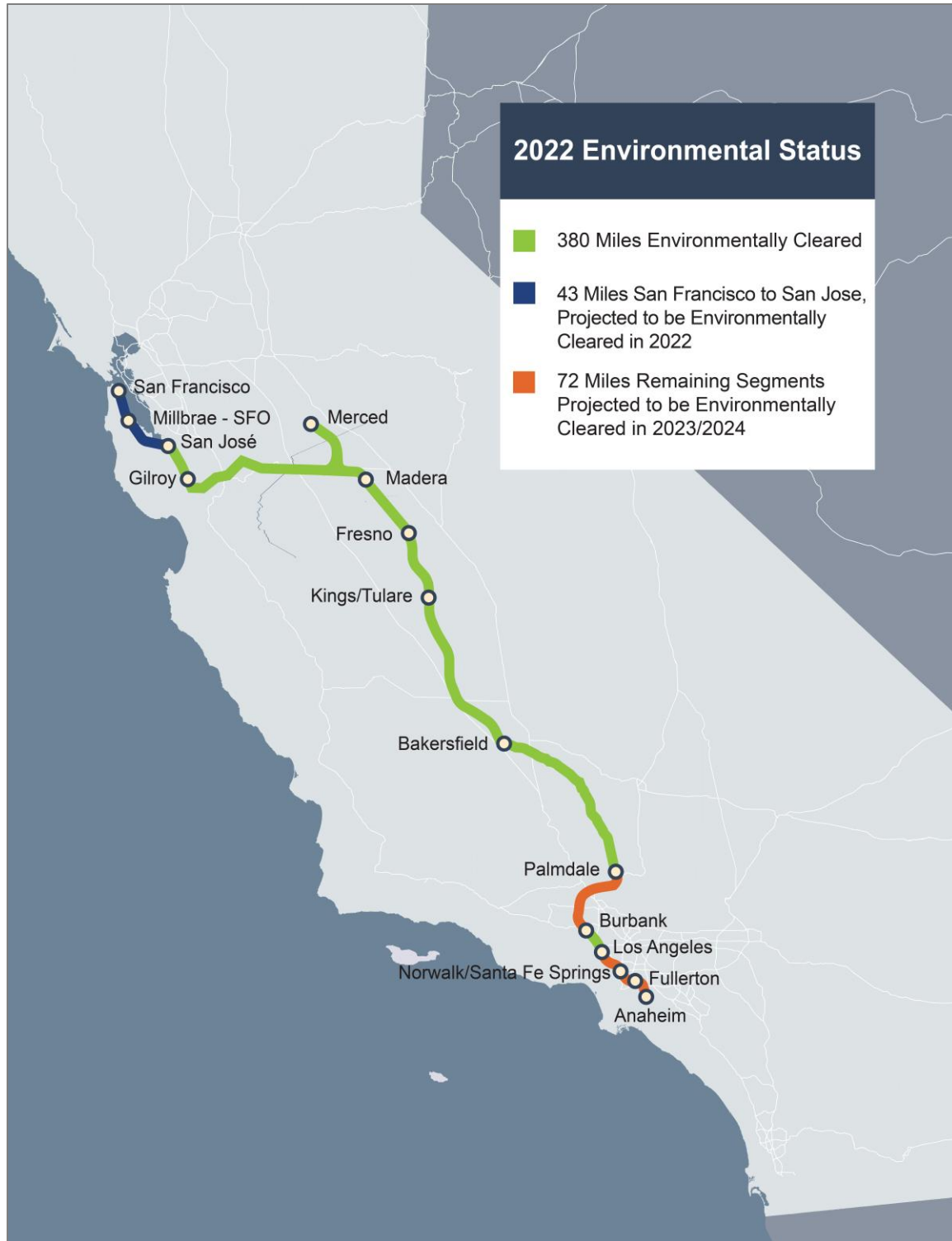


Figure 3 Map of Environmental Document Status and Progress

The Authority has 119 miles of construction under way in the Central Valley between Madera and north of Bakersfield, which forms the foundation of the HSR system (Authority 2012a, 2014a). The Authority's 2020 Business Plan supports expanding construction to 171 miles of HSR connecting Merced, Fresno, and Bakersfield as part of an early interim HSR service in the southern Central Valley (Authority 2020a). Preliminary studies indicate an initial HSR service in the Central Valley is a viable interim step toward the Phase 1 HSR system (Authority 2022b). The Authority has also previously found that adding the 79-mile Bakersfield to Palmdale Project Section to the Central Valley would help realize a viable initial HSR service by connecting the Central Valley to Palmdale and/or connecting the initial Silicon Valley to Central Valley HSR service to Palmdale, where the Palmdale Station would offer Metrolink connections to Los Angeles, even if funding for the HSR system between Palmdale and Los Angeles/Anaheim is not immediately available (Authority 2021d). The Authority also found that the San Jose to Merced Project Section would contribute to realizing a viable initial HSR service by connecting the Silicon Valley to Central Valley service to Palmdale and Los Angeles County. The Preferred Alternative for the San Francisco to San Jose Project Section would build on these approved HSR project sections and further contribute to realizing a viable initial HSR service, connecting the Bay Area to the Central Valley and Palmdale and Los Angeles County, creating an opportunity for a total of 382 miles of initial HSR service, and serving as a critical foundation of the statewide HSR system (Authority 2022b).

8.3.2 Provides a New Expedited and Consistent Travel Option that Connects to San Francisco

As discussed in the Authority's Business Plans, the Central Valley ranks as one of California's most underserved regions for rail transportation. The Central Valley is home to approximately 6 million residents and is becoming more prominent as the state's third regional economic engine. Fresno and Bakersfield, 2 of the 10 most populated cities in California, have experienced 20 percent population growth since 2000. The planned Merced to Bakersfield early interim HSR service will connect the three largest cities in the Central Valley and provide connections to existing and improved passenger rail and bus services to the north, west, and south of the Central Valley, reducing travel times by up to 100 minutes through the heart of California (Authority 2022c).

By connecting to the Merced to Bakersfield early interim HSR service and extending it to San Francisco, the Preferred Alternative would provide reduced travel time between the Central Valley and San Francisco. In addition, HSR service at the STC would expand modal connectivity among local and regional transit networks while providing new linkages to the North and East Bay. Specifically, HSR service at the STC, in downtown San Francisco, would connect HSR passengers to the Alameda–Contra Costa Transit District, BART, Caltrain, Golden Gate Transit, Greyhound, SamTrans, MUNI, WestCAT Lynx, Amtrak, and Paratransit buses. HSR service at the Millbrae Station would provide a direct connection to SFO as well as to regional bus transit by SamTrans lines. The new HSR mode would improve transportation options for travelers between the Bay Area and Los Angeles County.

8.3.3 Reduces Vehicle Miles Traveled

Extending the Merced to Bakersfield service further to Palmdale in the south and San Francisco in the north assuming the DTX project, a further reduction of 1,866 million annual vehicle miles is estimated which represents a further increase of 723 percent in vehicle miles saved over the Palmdale extension from Bakersfield. This large increase captures new travel markets using the HSR system and allows much longer travel distances by extending the system to San Francisco and to Palmdale. This extension also would offer higher frequency service with addition of a San Francisco to Palmdale service in addition to the Merced to Palmdale service. The service parameters were derived from the Silicon Valley to Central Valley alternative, which assumes higher service frequencies compared to the Merced to Bakersfield alternative (Authority 2022d).

8.3.4 Improves Air Quality

Based on the statewide analyses, the Central Valley segment (Merced to Bakersfield) shows reductions in all criteria pollutants and GHGs prior to implementation of the full Phase 1 system. The addition of the Bakersfield to Palmdale, San Jose to Merced, and San Francisco to San Jose Project Sections to the Central Valley segment would continue to develop these emissions savings statewide and is a key element to achieving the full emission reductions of the Phase 1 system (Authority 2022d).

8.3.5 Provides Economic and Social Benefits by Extending the Central Valley Construction to San Francisco

The Authority's current construction of 119 miles along the HSR alignment in the Central Valley is providing important economic benefits to the region and extension of the system to San Francisco would both increase the construction economic benefits and expand the benefits to other regions of the state.

In fiscal year 2020–2021, construction in the Central Valley supported more than 5,000 well-paying construction jobs for women and men working at 35 construction sites. These jobs benefited people who live in the region, including many small businesses, disadvantaged businesses, and disabled veteran businesses. As of March 31, 2022, construction worker statistics included:

- 72 percent of the people employed in the construction of the project lived in the region
- More than 700 small businesses were working on the project, including:
 - 225 certified Disadvantaged Business Enterprises
 - 80 certified Disabled Veteran Business Enterprises

This ongoing construction in the Central Valley is tied to the Board-approved Merced to Fresno (adopted 2012) and Fresno to Bakersfield (adopted 2014) Project Sections. Together, these two project sections are anticipated to support a total of over 33,600 direct, indirect, and induced job-years over the entire duration required to complete construction.

Since August 2021, additional project sections of the California HSR System have completed the CEQA/NEPA environmental review process and have been approved by the Board. As project funding becomes available, construction activities will be able to expand substantially to provide the necessary infrastructure to link San Francisco in the Bay Area to Palmdale in Los Angeles County. Based on estimates presented in each of the project section Final EIR/EIS documents, total estimated direct, indirect, and induced job creation includes the following:

- Bakersfield to Palmdale (adopted August 2021)—The 80-mile Bakersfield to Palmdale Project Section is estimated to support a total of 150,100 job-years.
- San Jose to Merced (adopted April 2022)—The 90-mile San Jose to Merced Project Section is estimated to support a total of 31,510 job-years.

Together, these four project sections are anticipated to support an estimated 215,256 job-years. These jobs would be based in the southern portion of the Bay Area, the Central Valley from Merced south to Bakersfield, and continuing south over the Tehachapi Mountains to Palmdale in Los Angeles County.

With approval of the San Francisco to San Jose Project Section, construction activities associated with the California HSR System would extend north from San Jose to San Francisco. The Project Section would be mostly within the existing Caltrain rail right-of-way; and as such, the 43-mile extension of the construction activities would be more limited than for other project sections. However, these construction activities would increase total construction job-years for the California HSR System by an additional 4,900 job-years, or an increase of about 2 percent. In

total, extending the Central Valley construction to San Francisco would increase total project construction jobs to more than 220,000.

The project construction expenditures related to the San Francisco to San Jose Project Section would benefit residents and businesses in the three counties through which HSR would travel—Santa Clara, San Mateo, and San Francisco Counties. The project would directly hire construction workers and would make purchases of goods and services. Through the Authority's Community Benefits Agreement, each prime contractor must commit 30 percent of all construction dollars to hiring local small businesses, including separate goals for the hiring of disadvantaged and disabled veteran businesses. Through a cooperative partnership with skilled craft unions, the Authority also would help to promote pre-apprenticeship and apprenticeship training programs in economically disadvantaged communities. As such, the project construction activities would generate broad indirect effects in the regional economy as local businesses provide goods and services to support project construction and as project workers spend portions of their wages on goods and services for themselves and their households.

8.3.6 Lays the Foundation for the Nationwide High-Speed Rail Industry

The Authority plans to begin full HSR service once it connects the Central Valley with Silicon Valley. This operation will be able to demonstrate the benefits of this new mode of transport (for the United States) and can lay the foundation for a nationwide HSR industry. The San Francisco to San Jose Project Section would contribute to expansion of the HSR system to see those major benefits.

A new HSR line requires a whole series of products, parts, and high-tech systems to operate. This starts with the trains and the thousands of components and parts, to the power systems, signaling and communication systems, high-tech control centers, workshops, and stations. A new HSR network will create new manufacturing industry including an extensive supply chain made up of thousands of specialty companies. This new domestic industry will encourage small businesses, and create long-term, good paying, family-supporting jobs. The U.S. High Speed Rail Association estimates there will be millions of long-term jobs created throughout this entirely new domestic manufacturing industry and that this new industry will keep growing for many decades, cross-stimulate a number of other industries along the way, and will be an economic boon for the United States well into the future (U.S. High Speed Rail Association 2022).

8.4 Benefits of the Preferred Alternative on Its Own

The Preferred Alternative offers the greatest benefits when viewed as part of the Phase 1 HSR system between San Francisco and Los Angeles/Anaheim. The Preferred Alternative also offers considerable benefits when viewed in conjunction with the already approved HSR sections between San Jose and Palmdale. The benefits, however, are further augmented by the benefits the Preferred Alternative offers on its own, even without considering other sections of the HSR system. Some of the benefits accrue inclusive of the San Jose Diridon Station Approach Subsection; other benefits accrue even without the subsection.

8.4.1 Connectivity and Integration with Local Transit

The overall effect of HSR is expected to be an increase in the use of other transit services as a complement to HSR service by providing transit connections to local geographies to and from the HSR stations. HSR riders at HSR stations would create new demands for Caltrain and other transit systems as they transfer from HSR to reach destinations served by other transit systems. For example, the Authority modeled that in 2040, HSR service would result in a net increase in Caltrain ridership by 6.5 percent compared to the 2040 No Project conditions (Table 3.2-20). The primary source of increase to Caltrain ridership would be the increase in HSR riders at the Millbrae Station, where Caltrain would serve as a feeder service to and from HSR.

The increase in HSR service over time would result in increased use of connecting transit systems by HSR passengers. The increase in HSR riders at the STC would also result in an increase to MUNI light rail service, MUNI bus, and BART system ridership. The increase in HSR riders at the Millbrae Station would also result in an increase to SamTrans and BART system ridership using the existing connections.

8.4.2 Circulation Benefits

The Preferred Alternative includes circulation improvements for the Millbrae Station area on the west side of the existing Caltrain corridor, including extension of California Drive to Victoria Avenue and a new pedestrian signal at the El Camino Real/Chadbourne Avenue intersection, which would improve access to the Millbrae Station for all modes. Existing access to the west side of the Millbrae Station is provided via side street stop-controlled intersections at El Camino Real/Linden Avenue and El Camino Real/Serra Avenue, as well as via California Drive to and from the south. The extension of California Drive to a signalized intersection at El Camino Real/Victoria Avenue, combined with a new pedestrian signal at Chadbourne Avenue, would improve accessibility to the west side of the Millbrae Station from El Camino Real. In addition, the Preferred Alternative would demolish and reconstruct the Tunnel Avenue overpass north of the intersection of Bayshore Boulevard/Valley Drive. This change to the roadway network would improve LOS conditions at the intersection of Bayshore Boulevard/Old County Road. The improvements in flow of traffic near the Millbrae Station and Bayshore Boulevard/Old County Road would have a beneficial effect on circulation and traffic safety.

8.4.3 Safety Benefits

The Preferred Alternative would be built according to international safety guidelines and would include several key safety mechanisms, such as positive train control, safety improvements at existing Caltrain stations, perimeter fencing, and four-quadrant gates at at-grade crossings. The Preferred Alternative would involve the installation of four-quadrant gates, barriers, and roadway channelization at 40 at-grade crossings for Alternative A, which would prevent drivers from traveling in opposing lanes to avoid the lowered gate arms. Pedestrian crossing gates would be built parallel to the tracks and would be aligned with the vehicular gates on either side of the roadway. The project would also complete the perimeter fencing of the Caltrain right-of-way, which would reduce the potential for train conflicts with motor vehicles, pedestrians, and cyclists and discourage trespassing. These project elements would have a beneficial effect on vehicular and pedestrian safety and would reduce traffic hazards by minimizing the potential for conflicts between trains and motor vehicles, pedestrians, and bicycles.

The Preferred Alternative would also include safety improvements at existing Caltrain stations. Major safety improvements would be implemented at the Broadway Caltrain Station. At this station, new northbound outboard platforms would be built to eliminate the need for passengers to board and alight from the train between the active tracks. This would improve the safety of passengers during train operations and eliminate the hold-out rule requiring oncoming trains to stop outside the station zone until the passengers are safely clear. Safety improvements would also be implemented at existing Caltrain station platforms to accommodate HSR trains passing through stations. These safety improvements could include increasing the width of the tactile platform strips that are currently installed at Caltrain stations, modifying the tactile platform strips to use raised bars instead of raised dots, and providing additional visual and audible warnings of approaching HSR trains. PCJPB, as the owner and operator of the Caltrain stations, would be responsible for design and implementation of safety improvements at Caltrain station platforms.

8.4.4 Benefits from Upgrading Infrastructure

The Preferred Alternative would include upgrades and improvements within the existing Caltrain corridor. These upgrades would expand and modernize the regional rail system, enhancing rail corridor infrastructure and increasing Caltrain maximum operating speeds from 79 to 110 mph.

8.4.5 Economic Benefits

- As described in the Final EIR/EIS, construction of the Preferred Alternative would generate sales tax revenue gains for the region over the 6-year construction period that have been estimated at approximately \$9.4 million. These sales tax revenue gains would increase local government revenues during the construction period and provide an economic benefit (Authority 2022a: Impact SOCIO#13)

- As described in the Final EIR/EIS, construction of the Preferred Alternative would generate approximately 4,900 direct, indirect and induced job-years (Authority 2022a: Table 3.17-9). This includes 380 direct operations and maintenance jobs including train operations, infrastructure and equipment maintenance, station and train cleaning, ticketing and other commercial activities. The 540 indirect annual jobs include additional employment supporting, servicing, or supplying train operations, administration and dispatching, infrastructure and equipment maintenance, station and train cleaning, ticketing and other commercial activities, and other occupations such as security, operations of concessions, and provision of goods and services to riders entering and leaving the HSR system (Authority 2022a: Impact SOCIO#14).
- As described in the Final EIR/EIS, operation of the Preferred Alternative would generate approximately 920 direct and indirect jobs annually (Authority 2022a: Table 3.17-13).
- As described in the Final EIR/EIS, the statewide HSR system (San Francisco to Los Angeles) could increase statewide employment by 102,000 jobs because of improved connectivity, of which 2,530 would be in the three-county RSA (Authority 2022a: Impact SOCIO#14).
- As the Authority has done in the Central Valley, the Authority will work to ensure that the local workforce is prepared for these kinds of economic opportunities by investing in workforce training and development through the Authority's Community Benefits Agreement (Final EIR/EIS Section 3.17.6.3, Project Impacts, Construction Impacts).

8.5 Conclusion

The Preferred Alternative for the San Francisco to San Jose Project Section of the California HSR System would result in certain significant impacts on the environment that cannot be avoided or substantially lessened with the application of feasible mitigation measures or feasible alternatives, as identified in Section 8.1, General Findings on Significant and Unavoidable Impact Associated with the Preferred Alternative, and as disclosed in the Final EIR/EIS. The Authority finds, however, that the above-enumerated benefits of the Preferred Alternative as part of the HSR system (Section 8.2) and viewed on its own (Section 8.3) outweigh the unavoidable adverse environmental effects. This finding is based on the Authority's careful consideration of and balancing of the unavoidable adverse environmental effects against the Preferred Alternatives' substantial environmental benefits, which render the unavoidable adverse environmental effects acceptable.

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